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UK METEOROLOGICAL OFFICE
GLOBAL DATA MONITORING REPORT

April 2002

Data Assimilation
Meteorological Office
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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Bracknell. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Bracknell in time for inclusion into the appropriate analysis (the current cut-off time is approximately 7.2 hours after each analysis time). The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background field). Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

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2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1and 2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or sea surface temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Bracknell and assimilated into model runs. Only data from the main hours of 00 UTC, 06 UTC, 12UTC and 18 UTC are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At the UK Met. Office, we monitor SYNOP pressure after it has been interpolated to our Global NWP Model's surface height. For most synoptic stations (about 75%), the surface pressure (at the model surface) is calculated from the reported station-level pressure, or, if this is not available, the height of a standard pressure-level (e.g. 850 hPa or 700 hPa). If neither of these are available, or if the reported station-level pressure is deemed unreliable, the reported mean sea-level pressure is used (about 25% of SYNOPs).

Aircraft observations

Tables 4A (300-150 hPa) and 4B (1000-301 hPa) contain lists of statistics calculated from data received from all airline carriers.

Figures 3A (300-150 hPa) and 3B (1000-301 hPa) show 10 degree lat/long box average numbers of aircraft reports in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS) received per day throughout the month at Bracknell and assimilated into model runs. Observations with a vector wind difference (compared with the model background field) of >60 m s^{-1} have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 4A-7A (300-150 hPa) and 4B-7B (1000-301 hPa) show wind statistics for AIREP/ASDAR in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS). Observations with a vector wind difference > 60 m s^{-1} have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure	Parameter
4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed (m s^{-1})
7	RMS observation-background vector (m s^{-1})

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Bracknell and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-39 show sounding statistics from the polar orbitting satellite NOAA-15. Figure 25 shows the mean daily number of ATOVS soundings, and figures 26-39 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.
N.B. The sounding data is bias-corrected (and thinned) before being assimilated in the UKMO NWP model.

Figure		Weighting function peak (hPa)
26	Mean	Surface (HIRS8)
27	SD	Surface (HIRS8)
28	Mean	700 (HIRS15)
29	SD	700 (HIRS15)
30	Mean	500-700 (HIRS11)
31	SD	500-700 (HIRS11)
32	Mean	400 (HIRS4)
33	SD	400 (HIRS4)
34	Mean	700 (AMSUA5)
35	SD	700 (AMSUA5)
36	Mean	300 (AMSUA7)
37	SD	300 (AMSUA7)
38	Mean	100 (AMSUA9)
39	RMS	100 (AMSUA9)

Figures 40-54 show sounding statistics from the polar orbitting satellite NOAA-16. Figure 40 shows the mean daily number of ATOVS soundings, and figures 41-54 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.
N.B. The sounding data is bias-corrected (and thinned) before being assimilated in the UKMO NWP model.

Figure		Weighting function peak (hPa)
41	Mean	Surface (HIRS8)
42	SD	Surface (HIRS8)
43	Mean	700 (HIRS15)
44	SD	700 (HIRS15)
45	Mean	500-700 (HIRS11)
46	SD	500-700 (HIRS11)
47	Mean	400 (HIRS4)
48	SD	400 (HIRS4)
49	Mean	700 (AMSUA5)
50	SD	700 (AMSUA5)
51	Mean	300 (AMSUA7)
52	SD	300 (AMSUA7)
53	Mean	100 (AMSUA9)
54	RMS	100 (AMSUA9)

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Bracknell during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Bracknell in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Bracknell from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics **(Geopotential Height and Windspeed at 100 and 500 hPa)** for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 have been replaced by statistics for GOES-8 and GOES-9.
5. April 96. 500 km and 120 km SATEMs replaced by 120 km resolution temperature profiles produced locally from the radiances disseminated by NESDIS.
6. February 97 Monitoring statistics for Meteosat 5 have been replaced by statistics for Meteosat 6.
7. Sept 97 Monitoring statistics for NOAA-12 removed. Figures 25-27 now show data for NOAA-11
8. January 1998. Increase in resolution of UKMO global forecast model.
9. April 1998. GOES winds ceased on 2nd March 1998, and were replaced with GOES high resolution winds from 15th.
10. June 1998. Monitoring statistics for Meteosat-6 were replaced by monitoring statistics for Meteosat-7, from 3rd June.
11. June 1998. Corrections in our processing of radiosonde data resulted in a decrease in the number of 500hPa geopotential heights in Figure 8 of about 230 per 24 hours (compared with previous reports), and a small increase in the number of 300hPa winds in Figure 9.
12. July 1998. Meteosat-5 began transmitting winds from 2nd July, at 63 degrees East (over the Indian ocean), and this data is included in the statistics.
13. July 1998. GOES-9 (at 135W) was replaced mid-month by GOES-10 (initially at 105W, moving towards 135W).
14. February 1999. Problems with NOAA-11, and TOVS data ceased to be assimilated from 26 February.
15. March 1999. UKMO introduced 3-D VAR assimilation system on 29 March, and also began assimilating ATOVS data from NOAA-15.
16. May 1999. Included statistics for ATOVS sounding data from NOAA-15.
17. September 1999. Included statistics for high resolution visible winds from Meteosat-5 and Meteosat-7.
18. October 1999. The 3-D VAR assimilation system was upgraded on 19 October, including improvements in the assimilation of ATOVS radiances, use of SSM/I surface wind speed, an improvement in the calculation of surface pressure for SYNOPs, and thinning and revision of observation errors of aircraft data.
19. November 1999. High resolution visible winds from Meteosat-5 and Meteosat-7 removed until used operationally.
20. April 2000. Aireps in Table 4 and Figures 3-7 split into ranges 300-150 hPa (A) and 1000-301 hPa (B).
21. September 2000. Corrected an error affecting the mean positions of a minority of buoys in Table 2.
22. November 2000. An error in the production of Table 6 was corrected. Previously, some sondes with suspect vector winds were being missed.
23. April 2001. Included statistics for ATOVS sounding data from NOAA-16.
24. May 2001. Included statistics for sea surface temperatures from marine surface observations.

TABLE 1

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: BRACKNELL
MONTH: April 2002

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for ships, fixed buoys and platforms.

Standard of comparison :Background field from UKMO global model.

Observation times :00, 06, 12, 18 UTC

Elements monitored
:Mean sea level pressure (hPa).
:Wind speed ($m\ s^{-1}$).
:Wind direction (Degrees).
:Sea surface temperature (Degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the wind observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT
:15 hPa (pressure)
:25 $m\ s^{-1}$ (vector wind)
:10 degrees (sea surface temperature)

SELECTION CRITERIA :NOBS ≥ 20 , and one or more of the following:

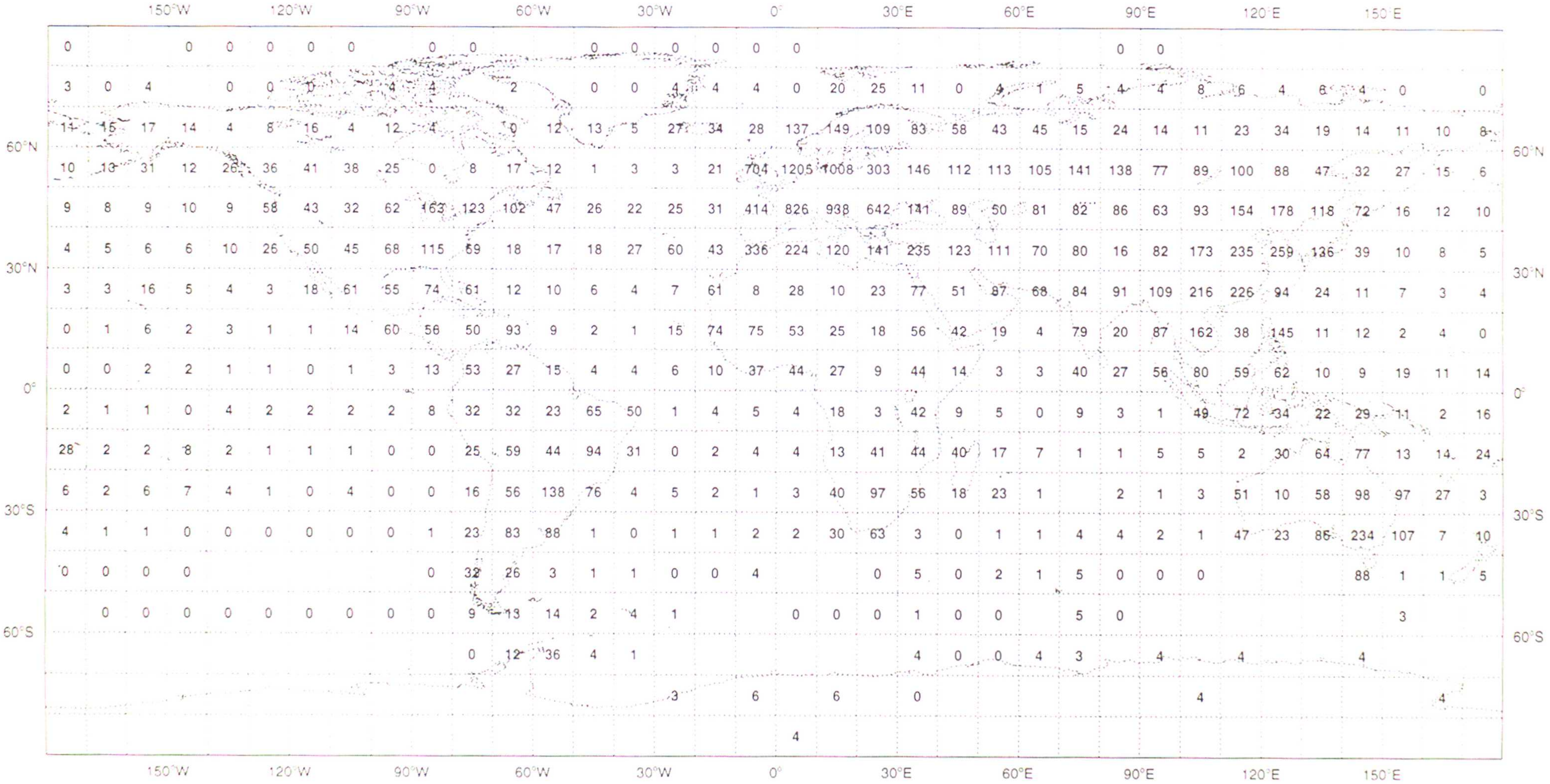
1.|bias|	$\geq$ 4 hPa	(pressure),
	$\geq$ 5 $m\ s^{-1}$	(wind speed),
	$\geq$ 30 degrees	(direction).
	$\geq$ 3 degrees	(sea surface temperature).
2.SD	$\geq$ 6 hPa	(pressure),
	$\geq$ 80 degrees	(direction).
	$\geq$ 5 degrees	(sea surface temperature).
3.PGE	$\geq$ 25	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 $m\ s^{-1}$

IDENTIFIER	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE									
BOAB	ALL	P	SUR	43	1	2	3.3	-4.8	5.8
CG2350	ALL	P	SUR	68	47	69	0.6	0.4	0.8
C6FE5	ALL	P	SUR	27	0	0	1.1	-4.4	4.6
DICB	ALL	P	SUR	20	0	0	1.2	-4.5	4.6
ELRR2	ALL	P	SUR	25	0	0	0.8	-4.2	4.3
ELXZ7	ALL	P	SUR	26	0	0	2.0	-4.2	4.7
ELYP8	ALL	P	SUR	32	0	0	0.9	-4.0	4.1
ELZF7	ALL	P	SUR	35	0	0	1.3	4.3	4.5
MVLA7	ALL	P	SUR	29	0	0	2.7	5.0	5.7
P3CE9	ALL	P	SUR	22	3	14	7.6	6.8	10.2
P3YS5	ALL	P	SUR	29	0	0	1.1	4.0	4.1
UBAU	ALL	P	SUR	32	0	0	2.2	-4.4	4.9
UBDO	ALL	P	SUR	26	21	81	5.6	-5.7	8.0
UCTR	ALL	P	SUR	39	3	8	6.0	1.5	6.2
UDYG	ALL	P	SUR	43	1	2	2.6	-4.5	5.3
UGGA	ALL	P	SUR	45	5	11	4.4	-6.9	8.2
UIAH	ALL	P	SUR	20	6	30	3.6	-1.4	3.9
VGDX	ALL	P	SUR	43	0	0	2.0	-4.6	5.0
VNW4455	ALL	P	SUR	52	0	0	3.5	4.2	5.5
VVML	ALL	P	SUR	22	0	0	1.4	5.4	5.6
V2PR	ALL	P	SUR	20	0	0	2.2	-5.1	5.6
V7BW9	ALL	P	SUR	21	0	0	0.8	-4.4	4.4
WCV7620	ALL	P	SUR	23	0	0	1.1	5.0	5.1
WCV8696	ALL	P	SUR	24	0	0	2.0	-6.0	6.3
8PNI	ALL	P	SUR	23	0	0	0.6	-4.0	4.0
9VHZ2	ALL	P	SUR	44	0	0	2.0	-4.2	4.6
WIND SPEED									
C6NZ3	ALL	SPEED	SUR	41	1	2	5.3	7.3	9.0
DATG	ALL	SPEED	SUR	22	0	0	5.5	5.0	7.4
DHPP	ALL	SPEED	SUR	40	0	0	4.1	5.0	6.4
DZSE	ALL	SPEED	SUR	49	0	0	2.0	6.1	6.4
HP6038	ALL	SPEED	SUR	206	0	0	3.1	5.2	6.0
LART5	ALL	SPEED	SUR	23	0	0	4.1	5.3	6.7
LAVX	ALL	SPEED	SUR	20	1	5	3.5	7.1	7.9
UCJU	ALL	SPEED	SUR	20	0	0	4.1	5.6	6.9
V2FA2	ALL	SPEED	SUR	46	0	0	2.2	5.5	5.9
V2FN	ALL	SPEED	SUR	24	0	0	5.7	12.9	14.1
44145	ALL	SPEED	SUR	199	0	0	4.3	5.7	7.1
WIND DIRECTION									
P3RD8	ALL	DIRN.	SUR	52	0	0	50.9	31.2	59.7
UCTR	ALL	DIRN.	SUR	35	0	0	94.1	-3.2	94.2
VGDX	ALL	DIRN.	SUR	33	1	3	31.9	-32.3	45.4
43001	ALL	DIRN.	SUR	34	0	0	20.3	46.6	50.8
46061	ALL	DIRN.	SUR	389	0	0	36.7	-36.0	51.4
SEA SURFACE TEMPERATURE									
BBXX KS0	ALL	SST	SUR	264	72	27	3.0	-0.9	3.2
CG8048	ALL	SST	SUR	29	29	100			
C6HS4	ALL	SST	SUR	36	1	3	2.2	3.3	3.9
C6JD7	ALL	SST	SUR	20	0	0	5.3	0.5	5.3
C6QO9	ALL	SST	SUR	40	1	2	1.3	4.0	4.2
DBBX	ALL	SST	SUR	540	189	35	0.9	0.0	0.9
DQVG	ALL	SST	SUR	54	0	0	1.9	3.2	3.7
ELOG5	ALL	SST	SUR	54	0	0	2.0	4.3	4.8
ELWT7	ALL	SST	SUR	32	22	69	0.3	0.8	0.9
ELXO3	ALL	SST	SUR	124	0	0	0.9	-3.4	3.5

IDENTIFIER	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
SEA SURFACE TEMPERATURE									
FNVA	ALL	SST	SUR	93	16	17	0.3	9.5	9.5
H9GW	ALL	SST	SUR	24	0	0	1.2	4.1	4.3
H9RS	ALL	SST	SUR	41	22	54	0.9	6.7	6.7
JADY	ALL	SST	SUR	57	0	0	0.8	5.8	5.8
KGJX	ALL	SST	SUR	39	1	3	1.4	4.0	4.3
KS003	ALL	SST	SUR	121	1	1	2.4	-5.9	6.4
KS005	ALL	SST	SUR	90	76	84	4.6	-4.1	6.1
KS014	ALL	SST	SUR	64	28	44	2.0	1.6	2.5
LAJY4	ALL	SST	SUR	53	0	0	1.8	5.4	5.7
LAON4	ALL	SST	SUR	62	6	10	2.9	3.4	4.5
MVLA7	ALL	SST	SUR	28	0	0	1.2	-4.0	4.2
PJOX	ALL	SST	SUR	44	0	0	0.6	-4.9	4.9
P3FV6	ALL	SST	SUR	54	0	0	1.9	-3.4	3.9
SHIPEU	ALL	SST	SUR	26	11	42	0.6	0.8	1.0
TSMS	ALL	SST	SUR	46	0	0	0.7	-4.5	4.6
UAMY	ALL	SST	SUR	46	0	0	0.9	-4.1	4.2
UBDO	ALL	SST	SUR	26	0	0	2.0	-4.0	4.5
UIAH	ALL	SST	SUR	20	8	40	0.2	0.2	0.3
VCLM	ALL	SST	SUR	160	160	100			
VDFP	ALL	SST	SUR	21	6	29	1.9	1.3	2.3
VGLZ	ALL	SST	SUR	36	36	100			
VGNW	ALL	SST	SUR	32	9	28	1.5	1.6	2.2
VRRB	ALL	SST	SUR	35	0	0	1.7	-4.2	4.5
VRVB9	ALL	SST	SUR	21	1	5	1.9	5.0	5.4
V2MA3	ALL	SST	SUR	22	1	5	5.2	0.2	5.2
WCW9126	ALL	SST	SUR	24	18	75	1.3	-0.3	1.4
WCZ9380	ALL	SST	SUR	25	1	4	1.0	6.2	6.3
WGJF	ALL	SST	SUR	28	9	32	2.6	-2.6	3.6
WZJD	ALL	SST	SUR	50	0	0	1.8	-3.2	3.7
YJQL3	ALL	SST	SUR	25	0	0	1.0	-4.7	4.8
ZCBO6	ALL	SST	SUR	23	6	26	3.2	-2.4	4.0
ZNND9	ALL	SST	SUR	28	0	0	1.0	-3.8	3.9
3ECM7	ALL	SST	SUR	85	0	0	1.2	3.1	3.3
3FDZ5	ALL	SST	SUR	40	0	0	1.7	4.0	4.4
3FJV4	ALL	SST	SUR	22	1	5	0.7	3.3	3.4
44004	ALL	SST	SUR	623	0	0	2.1	-3.0	3.7
45147	ALL	SST	SUR	179	179	100			
46131	ALL	SST	SUR	342	342	100			
46146	ALL	SST	SUR	624	624	100			
46181	ALL	SST	SUR	623	623	100			

Figure 1. SHIP/SYNOP mean daily count. APRIL 2002
Main hours only
Global average number of observations in 24 hours = 20671



0			0	0	0	0	0		0	0			0	0	0	0	0	0								0	0								
3	0	4		0	0	0		4	4		2		0	0	4	4	4	0	20	25	11	0	4	1	5	4	4	8	6	4	6	4	0		0
11	15	17	14	4	8	16	4	12	4		0	12	13	5	27	34	28	137	149	109	83	58	43	45	15	24	14	11	23	34	19	14	11	10	8
10	13	31	12	26	36	41	38	25	0	8	17	12	1	3	3	21	704	1205	1008	303	146	112	113	105	141	138	77	89	100	88	47	32	27	15	6
9	8	9	10	9	58	43	32	62	163	123	102	47	26	22	25	31	414	826	938	642	141	89	50	81	82	86	63	93	154	178	118	72	16	12	10
4	5	6	6	10	26	50	45	68	115	69	18	17	18	27	60	43	336	224	120	141	235	123	111	70	80	16	82	173	235	259	136	39	10	8	5
3	3	16	5	4	3	18	61	55	74	61	12	10	6	4	7	61	8	28	10	23	77	51	87	68	84	91	109	216	226	94	24	11	7	3	4
0	1	6	2	3	1	1	14	60	56	50	93	9	2	1	15	74	75	53	25	18	56	42	19	4	79	20	87	162	38	145	11	12	2	4	0
0	0	2	2	1	1	0	1	3	13	53	27	15	4	4	6	10	37	44	27	9	44	14	3	3	40	27	56	80	59	62	10	9	19	11	14
2	1	1	0	4	2	2	2	2	8	32	32	23	65	50	1	4	5	4	18	3	42	9	5	0	9	3	1	49	72	34	22	29	11	2	16
28	2	2	8	2	1	1	1	0	0	25	59	44	94	31	0	2	4	4	13	41	44	40	17	7	1	1	5	5	2	30	64	77	13	14	24
6	2	6	7	4	1	0	4	0	0	16	56	138	76	4	5	2	1	3	40	97	56	18	23	1		2	1	3	51	10	58	98	97	27	3
4	1	1	0	0	0	0	0	0	1	23	83	88	1	0	1	1	2	2	30	63	3	0	1	1	4	4	2	1	47	23	86	234	107	7	10
0	0	0	0						0	32	26	3	1	1	0	0	4			0	5	0	2	1	5	0	0	0				88	1	1	5
	0	0	0	0	0	0	0	0	0	9	13	14	2	4	1			0	0	0	1	0	0		5	0							3		
										0	12	36	4	1							4	0	0	4	3		4		4			4			
															3		6		6		0							4						4	
																		4																	

TABLE 2

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: BRACKNELL
MONTH: April 2002

Monitoring procedures			
Period		:One calendar month.	
Data monitored		:Reports from each unique identifier for drifting buoys.	
Standard of comparison		:Background field from UKMO global model.	
Position		:Average latitude and longitude for period.	
Observation times		:00, 06, 12, 18 UTC	
Elements monitored		:Mean sea level pressure (hPa). :Wind speed ($m\ s^{-1}$). :Wind direction (degrees). :Sea surface temperature (degrees).	
Parameters monitored			
	:NOBS	:Number of observations received excluding duplicates.	
	:NGE	:Number of observations with gross errors.	
	:PGE	:Percentage of observations with gross errors.	
	:SD	:SD of difference of observations from background values excluding those with gross errors.	
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. a positive bias indicates the wind observation is veered to the background.**	
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.	
GROSS ERROR LIMIT	:15 hPa	(pressure)	
	:25 $m\ s^{-1}$	(vector wind)	
	:10 degrees	(sea surface temperature)	
SELECTION CRITERIA :	NOBS	≥ 20 , and one or more of the following:	
	1.|bias|	≥ 4 hPa	(pressure),
		≥ 5 $m\ s^{-1}$	(wind speed),
		≥ 30 degrees	(direction).
		≥ 3 degrees	(sea surface temperature).
	2.SD	≥ 6 hPa	(pressure),
		≥ 80 degrees	(direction).
		≥ 5 degrees	(sea surface temperature).
	3.PGE	≥ 25.	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 $m\ s^{-1}$

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
25541	83.9	90.6	ALL	P	SUR	733	280	38	8.6	-4.2	9.5
33633	-55.9	-60.1	ALL	P	SUR	215	215	100			
61533	34.5	32.0	ALL	P	SUR	246	123	50	3.1	11.9	12.3
74520	-65.0	-34.5	ALL	P	SUR	636	33	5	6.4	-1.4	6.5
WIND SPEED											
23924	14.4	88.3	ALL	SPEED	SUR	64	0	0	2.1	11.3	11.5
42533	38.0	-67.8	ALL	SPEED	SUR	326	172	53	5.8	16.4	17.4
52644	19.3	123.3	ALL	SPEED	SUR	155	91	59	8.3	4.6	9.5
WIND DIRECTION											
16950	-37.1	73.7	ALL	SST	SUR	127	0	0	2.2	-5.3	5.7
21645	53.9	-179.9	ALL	SST	SUR	41	41	100			
23911	14.5	88.4	ALL	SST	SUR	81	28	35	5.2	-0.5	5.2
31974	-40.2	-26.1	ALL	SST	SUR	124	0	0	0.3	3.0	3.0
33502	-32.6	-20.4	ALL	SST	SUR	107	0	0	0.3	5.0	5.0
42533	37.9	-68.1	ALL	SST	SUR	568	0	0	5.1	2.8	5.8
44502	43.0	-47.5	ALL	SST	SUR	184	45	24	3.5	-4.2	5.5
44514	40.5	-59.7	ALL	SST	SUR	332	0	0	1.9	-3.8	4.2
44601	42.4	-60.5	ALL	SST	SUR	46	0	0	1.9	5.2	5.5
44602	42.2	-56.2	ALL	SST	SUR	49	0	0	0.9	3.6	3.7
46972	21.9	-127.3	ALL	SST	SUR	169	0	0	0.3	3.7	3.7
51510	11.9	142.1	ALL	SST	SUR	32	0	0	0.6	3.2	3.3
55905	-48.5	-149.4	ALL	SST	SUR	634	0	0	0.4	3.1	3.1
55911	-53.8	-126.4	ALL	SST	SUR	436	0	0	0.5	5.2	5.2
61528	41.3	36.3	ALL	SST	SUR	205	0	0	1.0	4.0	4.1
61658	44.4	28.7	ALL	SST	SUR	221	133	60	2.0	5.7	6.1
61659	42.8	40.7	ALL	SST	SUR	126	78	62	2.7	3.5	4.4
64552	63.8	-36.4	ALL	SST	SUR	1122	0	0	2.0	5.0	5.4

Figure 2. DRIFTER mean daily count. APRIL 2002

Main hours only

Global average number of observations in 24 hours = 9678

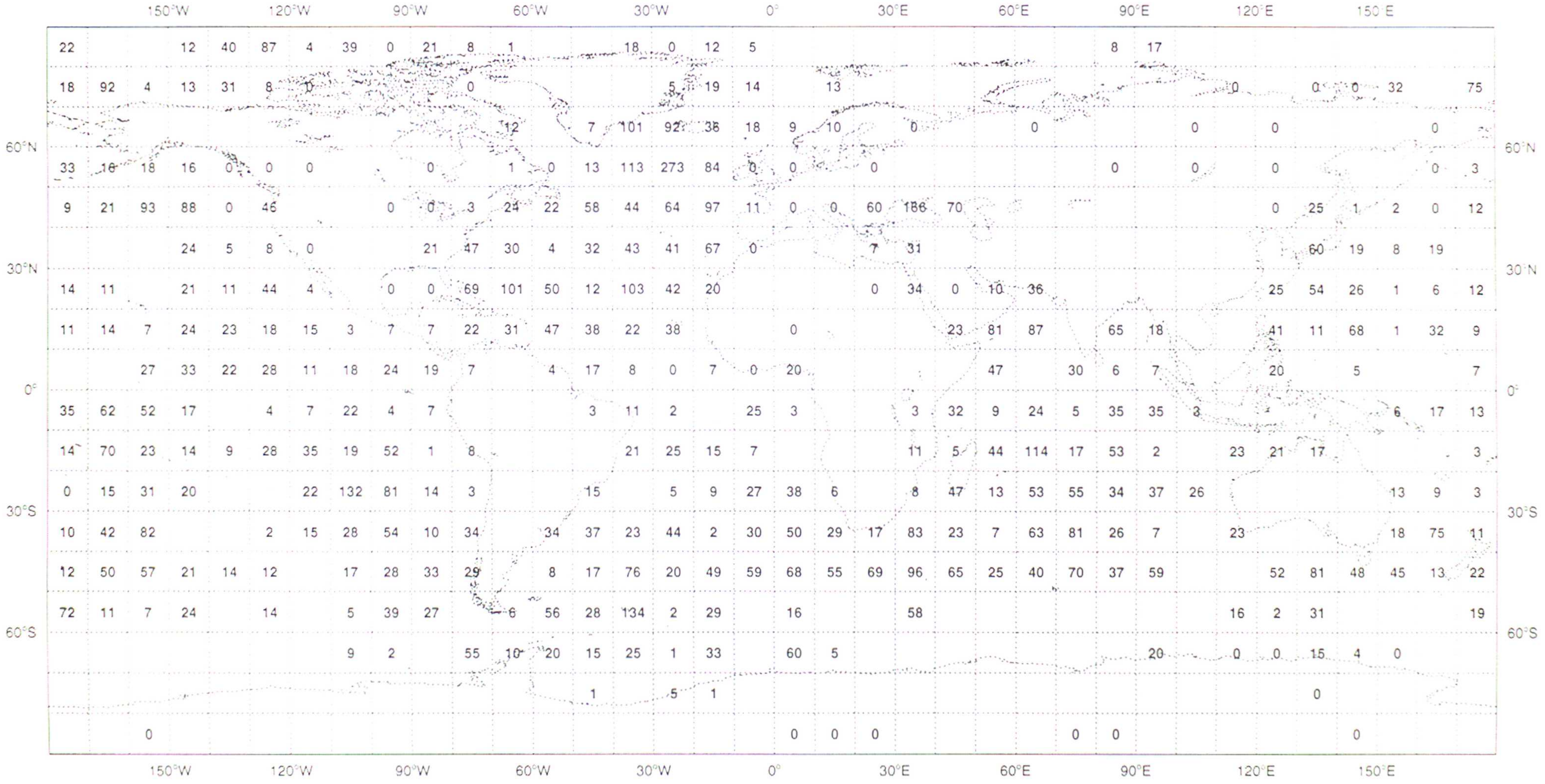

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
22 12 40 87 4 39 0 21 8 1 18 0 12 5 8 17
18 92 4 13 31 8 0 0 5 19 14 13 0 0 0 32 75
12 7 101 92 38 18 9 10 0 0 0 0 0
33 16 18 16 0 0 0 0 1 0 13 113 273 84 0 0 0 0 0 0 0 3
9 21 93 88 0 46 0 0 3 24 22 58 44 64 97 11 0 0 60 186 70 0 25 1 2 0 12
24 5 8 0 21 47 30 4 32 43 41 67 0 7 31 60 19 8 19
14 11 21 11 44 4 0 0 69 101 50 12 103 42 20 0 34 0 10 36 25 54 26 1 6 12
11 14 7 24 23 18 15 3 7 7 22 31 47 38 22 38 0 23 81 87 65 18 41 11 68 1 32 9
27 33 22 28 11 18 24 19 7 4 17 8 0 7 0 20 47 30 6 7 20 5 7
35 62 52 17 4 7 22 4 7 3 11 2 25 3 3 32 9 24 5 35 35 3 6 17 13
14 70 23 14 9 28 35 19 52 1 8 21 25 15 7 11 5 44 114 17 53 2 23 21 17 3
0 15 31 20 22 132 81 14 3 15 5 9 27 38 6 8 47 13 53 55 34 37 26 13 9 3
10 42 82 2 15 28 54 10 34 34 37 23 44 2 30 50 29 17 83 23 7 63 81 26 7 23 18 75 11
12 50 57 21 14 12 17 28 33 29 8 17 76 20 49 59 68 55 69 96 65 25 40 70 37 59 52 81 48 45 13 22
72 11 7 24 14 5 39 27 6 56 28 134 2 29 16 58 16 2 31 19
9 2 55 10 20 15 25 1 33 60 5 20 0 0 15 4 0
1 5 1 0
0 0 0 0 0 0 0
150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S

TABLE 3

MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: BRACKNELL
MONTH: April 2002

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for synops & autosynops.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Surface pressure (hPa).
Parameters monitored	:HT(m)	:Station height (in metres) as given in WMO No. 9 Vol A
	:RP	:Pressure reporting practice M=mean sea level pressure (hPa) reported. S=Station level pressure reported. 8=Geopotential height (m) of 850 hPa surface reported. 7=Geopotential height (m) of 700 hPa surface reported.
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	:Percentage of observations flagged excluding those with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:15 hPa	(pressure)
SELECTION CRITERIA	:NOBS	≥ 20 ,and one or more of the following:
	1.|bias|	≥ 4 hPa
	2. SD	≥ 6 hPa
	3.PGE	≥ 25.

N.B. For stn ht ≥ 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

WMO REGION 1:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
60437	36.3N	2.8E	981	S8	76	0	0	0	0.9	-6.7	6.8
60476	35.4N	7.2E	1116	S8	74	8	11	0	0.7	13.6	13.6
60728	36.4N	10.7E	1	MS	45	1	2	2	1.0	-8.1	8.2
61492	16.1N	13.5W	18	MS	63	0	0	0	1.5	4.2	4.5
62790	12.1N	24.9E	674	MS	79	3	4	1	1.5	4.4	4.6
63160	10.4N	45.0E	9	M	27	1	4	4	0.9	4.2	4.3
63330	13.5N	39.5E	2070	MS	32	31	97	50	0.0	-13.9	13.9
63333	11.1N	39.7E	1903	MS	36	0	0	3	2.0	5.1	5.5
63334	10.3N	37.7E	2515	MS	38	0	0	0	1.2	11.2	11.3
63402	7.7N	36.8E	1725	S	36	1	3	3	0.8	8.0	8.0
63450	9.0N	38.8E	2354	MS	38	1	3	0	0.6	4.4	4.4
63453	8.9N	39.9E	930	S	33	1	3	0	0.6	-4.1	4.1
63471	9.6N	41.9E	1260	MS	37	0	0	0	0.7	10.4	10.4
63478	5.9N	43.6E	295	M	30	0	0	0	0.9	5.3	5.4
63801	4.9S	29.6E	882	S8	48	1	2	0	1.1	8.7	8.8
65355	9.8N	1.1E	342	MS	90	0	0	1	2.3	-11.2	11.4
68338	26.9S	24.6E	1234	S8	58	58	100	0			
68396	26.5S	31.3E	641	S8	57	0	0	2	1.5	4.8	5.0
68575	30.0S	30.0E	1175	S8	102	102	100	0			

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
23975	60.4N	88.4E	86	7	116	115	99	0	0.0	-9.0	9.0
30967	49.9N	115.8E	623	MS	86	1	1	0	1.5	-6.3	6.5
38744	39.3N	73.3E	4267	S8	34	25	74	3	3.9	0.8	4.0
40713	37.4N	46.3E	1475	MS	89	1	1	81	5.2	10.4	11.6
40741	36.6N	61.2E	235	MS	92	0	0	0	1.4	-4.4	4.6
40757	35.6N	53.4E	1171	MS	91	0	0	0	1.3	4.4	4.6
41254	23.1N	57.7E	1755	S8	56	56	100	0			
41396	16.0N	48.9E	700	MS	41	1	2	0	0.7	6.6	6.6
41466	13.7N	44.1E	1402	8	40	0	0	0	0.6	-5.4	5.4
43415	8.8N	80.5E	98	S	60	60	100	100			
47022	40.8N	128.2E	1200	S	60	0	0	2	1.5	4.7	4.9
47127	36.9N	127.0E	16	MS	118	0	0	0	1.0	-11.8	11.8
51495	43.5N	91.6E	874	M	116	0	0	0	2.1	6.2	6.5
52602	38.8N	93.4E	2734	S	118	0	0	0	1.4	-7.2	7.3
52866	36.6N	101.8E	2262	S	118	0	0	0	1.3	-4.8	5.0
52955	35.6N	100.8E	3201	S	118	0	0	0	1.0	11.5	11.5
56144	31.8N	98.6E	3184	S	118	0	0	0	1.2	-5.5	5.6
56146	31.6N	100.0E	339	S	118	118	100	0			
56385	29.5N	103.3E	3049	S	118	0	0	4	1.9	-5.1	5.4
56444	28.5N	98.9E	3488	S	118	61	52	32	0.5	13.8	13.8
56462	29.0N	101.5E	2994	S	118	0	0	1	1.6	8.4	8.6

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
80099	7.1N	70.7W	128	MS	46	0	0	0	1.2	-5.8	5.9
80342	1.4N	77.3W	1796	S	41	0	0	0	0.8	4.3	4.4
82181	2.0S	54.1W	146	MS	76	0	0	0	1.4	5.0	5.2
82704	7.6S	72.7W	170	MS	84	0	0	0	1.5	-4.3	4.6
83235	12.4S	46.4W	604	MS	85	0	0	1	1.3	6.6	6.7
83332	14.1S	46.4W	826	MS	84	24	29	0	0.7	13.7	13.7
83531	18.6S	46.5W	940	MS	87	1	1	1	0.7	-6.8	6.8
83836	25.5S	50.6W	837	MS	87	0	0	0	0.5	-5.1	5.1
84377	3.8S	73.3W	125	MS	87	0	0	1	1.8	4.4	4.8
84425	5.9S	76.1W	179	MS	59	0	0	0	1.5	4.4	4.6

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
84455	6.5S	76.4W	281	MS	67	0	0	0	1.3	7.4	7.5
84472	7.1S	78.5W	2620	S	42	0	0	0	0.7	-5.4	5.4
84474	7.2S	76.7W	350	S	22	0	0	0	1.4	11.1	11.2
84686	13.6S	72.0W	3248	S	92	0	0	1	1.0	-4.0	4.1
84688	13.7S	73.4W	3444	S	36	1	3	0	0.7	-12.4	12.4
84720	14.9S	75.0W	567	M	41	0	0	0	0.7	5.3	5.3
84782	18.1S	70.3W	468	MS	72	0	0	0	1.1	8.0	8.1
85140	14.3S	67.4W	140	MS	56	0	0	0	2.0	5.5	5.9
85141	14.5S	67.6W	204	MS	56	0	0	0	1.9	4.8	5.2
85264	18.5S	64.1W	1998	S	53	53	100	0			
85312	19.8S	63.9W	992	S	42	0	0	0	1.6	-10.3	10.4
85345	21.3S	63.4W	398	MS	39	0	0	0	1.6	4.1	4.4
85394	22.8S	64.3W	381	MS	38	1	3	34	3.9	6.2	7.3
85406	18.3S	70.3W	55	M	115	0	0	0	0.9	4.3	4.4
85432	22.5S	68.9W	2320	S8	79	0	0	0	0.7	5.8	5.8
86065	22.7S	61.5W	220	M	35	0	0	3	2.3	4.4	5.0
88986	59.4S	27.3W	78	MS	457	457	100	0			

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
71023	65.9N	89.5W	18	MS	118	118	100	0			
71506	66.9N	136.3W	720	MS	117	0	0	0	1.0	-4.0	4.1
71747	48.8N	91.6W	424	MS	117	0	0	0	0.8	4.2	4.3
72327	36.1N	86.7W	182	MS	118	0	0	0	0.7	4.0	4.1
76118	30.4N	109.7W	1040	MS	33	0	0	0	0.7	-11.1	11.1
76243	28.7N	100.5W	250	MS	82	0	0	1	1.3	4.8	5.0
76625	20.6N	100.4W	1813	MS	34	1	3	0	0.6	-9.7	9.7
76640	20.9N	97.4W	28	MS	95	1	1	1	0.8	4.3	4.4
76658	19.2N	103.7W	494	MS	35	2	6	6	0.7	5.6	5.6
76743	18.0N	92.9W	10	MS	57	0	0	0	1.6	6.3	6.5
76903	14.9N	92.3W	118	MS	102	0	0	0	0.8	6.3	6.4

WMO REGION 5:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
92010	6.1S	145.4E	1587	M	37	0	0	0	0.9	10.6	10.6
94322	20.2S	130.0E	340	MS	108	108	100	19			
94368	20.3S	149.0E	2	MS	117	0	0	100	0.4	-4.8	4.8
95815	35.1S	144.0E	72	MS	118	0	0	0	1.7	6.1	6.3
96505	3.7N	115.7E	905	S8	30	29	97	0	0.0	1.7	1.7
97378	10.7S	123.1E	1	MS	32	32	100	0			

WMO REGION 6:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
06685	47.0N	9.1E	515	MS	118	0	0	12	1.3	5.5	5.7
10557	50.5N	11.1E	845	S8	354	354	100	0			
12140	54.4N	18.7E	2	MS	118	0	0	1	0.7	8.1	8.1
13269	44.3N	19.9E	176	MS	117	1	1	1	0.9	8.3	8.3
14554	44.9N	18.4E	140	S	57	2	4	5	2.7	-12.4	12.7
14650	43.8N	18.0E	972	S	58	1	2	2	0.7	4.7	4.8
15284	45.6N	26.4E	1632	S8	48	0	0	0	2.2	5.1	5.6
16036	46.0N	12.6E	128	S8	21	0	0	29	4.4	7.0	8.3
17092	39.8N	39.5E	1218	S8	116	0	0	0	1.1	6.5	6.6
17203	38.9N	40.5E	1177	S8	112	0	0	0	1.0	8.6	8.7

ANTARCTIC:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89004	71.7S	2.8W	815	MS	92	0	0	0	1.7	-6.4	6.6
89253	63.2S	55.4W	75	M	223	0	0	2	2.6	4.7	5.4
89263	66.0S	66.1W	20	M	165	1	1	0	1.9	9.9	10.1
89264	71.4S	68.9W	780	S	248	0	0	0	1.3	7.2	7.3
89266	72.2S	60.3W	91	S	240	175	73	0	3.4	-13.5	13.9
89272	74.8S	71.5W	1369	S	241	241	100	0			
89512	70.8S	11.8E	140	MS	117	0	0	1	1.9	-4.0	4.4
89637	69.9S	130.0E	2560	S	292	65	22	0	1.1	13.7	13.7
89744	74.0S	43.0E	3353	S	258	0	0	0	0.8	7.4	7.4
89769	78.5S	168.4E	50	S	373	373	100	0			
89847	67.6S	146.0E	30	S	292	6	2	0	2.5	-8.4	8.8

TABLE 4A

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: April 2002

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :300.0 - 150.0 hPa

Elements monitored :TEMP in °C ; WIND in $m\ s^{-1}$

Parameters monitored

:N REP.	:Number of observations received excluding duplicates.
:PG	:Percentage of observations with gross errors.
:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
:PC	:Percentage of observations with calm winds.
:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 $m\ s^{-1}$ Vector Wind

SELECTION CRITERIA :N REP ≥ 20

NB : All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAH	1758	0	44	1.4	0.1	1743	0	44	0	6.4	0.0
AAL	5760	1	34	1.3	0.0	5580	0	34	0	6.6	-0.1
AAR	1336	0	5	1.6	-0.6	1340	0	5	0	7.8	0.8
ACA	2960	1	12	1.7	-0.1	2770	0	12	0	7.7	0.7
AEA	798	0	3	1.5	0.4	413	0	4	0	6.9	0.8
AEL	657	0	9	1.6	-0.6	506	0	10	0	7.6	0.9
AEY	223	0	4	2.2	1.2	167	0	5	0	9.8	0.5
AFL	450	0	3	1.8	0.3	393	1	3	0	7.3	0.7
AFR	1615	1	8	1.6	0.3	1231	0	10	0	7.7	0.6
AIH	312	0	4	1.2	-0.1	258	0	3	0	6.3	0.6
AJM	371	1	3	1.3	-0.3	287	0	3	0	7.6	0.6
AJX	258	0	6	1.9	0.6	260	0	4	0	8.3	0.6
AMM	108	1	15	1.4	0.4	68	1	16	0	6.8	0.2
AMT	578	0	44	1.4	0.8	577	0	45	0	6.0	-0.1
AMX	277	2	6	1.4	0.0	214	1	7	0	9.4	0.2
ANA	280	0	5	1.9	0.8	287	0	5	0	7.6	0.3
ANZ	4067	0	34	1.3	0.4	4030	0	34	0	6.7	1.0
AVA	231	0	3	1.8	0.8	136	0	0	0	6.4	1.4
AVE	139	4	7	1.7	0.7	68	0	3	0	7.3	0.6
AVN	110	0	46	0.8	0.2	108	0	46	0	6.9	-0.5
AXF	37	5	27	2.0	0.0	37	0	22	0	8.1	0.6
AZA	425	0	6	2.0	0.5	356	0	6	0	8.8	0.5
BAF	34	3	3	1.6	-0.8	31	0	0	0	4.7	1.6
BAL	240	0	9	1.2	0.0	186	1	12	0	8.0	-0.4
BAW	705	1	8	1.7	-0.3	636	0	7	0	6.6	0.6
BLX	25	0	0	1.3	-0.7	24	0	0	0	4.1	1.0
BSK	29	0	17	3.1	-1.3	26	0	12	0	9.8	2.6
BWA	261	1	6	1.9	1.4	165	1	13	0	9.4	0.6
CAL	91	0	8	1.9	0.3	94	0	7	0	6.9	0.2
CCA	242	1	14	2.3	0.3	255	1	100	0	12.3	0.1
CES	353	0	6	1.5	0.5	357	0	9	0	8.8	0.2
CFC	23	9	17	2.3	-0.9	21	0	14	0	11.1	4.4
CFG	865	1	4	1.5	-0.4	694	0	4	0	7.4	0.0
CGH	22	0	41	2.3	0.8	22	0	36	0	5.9	1.2
CGL	28	0	0	1.3	0.0	30	0	0	0	6.5	0.4
CKS	272	1	45	1.8	1.2	270	0	46	0	8.0	0.1
CLX	389	1	7	1.5	-0.3	326	0	10	0	7.5	0.3
CMI	42	0	17	1.4	0.1	55	0	11	0	4.9	1.4
COA	1083	1	44	1.3	-0.1	1037	0	45	0	6.0	-0.2
CPA	44	0	11	1.1	0.4	48	0	19	0	12.3	2.3
CRL	838	1	8	1.7	0.3	574	1	8	0	7.4	1.0
CSN	82	0	10	1.5	0.0	84	0	13	0	8.5	2.0
CUB	246	0	4	1.9	1.2	179	1	7	0	9.7	0.5
DAL	2808	0	40	1.3	-0.1	2702	0	42	0	6.7	0.1
DBR	22	5	9	1.4	-0.6	22	0	9	0	11.1	0.1
DCE	123	0	8	1.5	0.2	107	0	10	0	8.2	0.6
DCS	25	0	4	1.2	-0.5	25	0	4	0	4.4	0.8
DLH	1191	0	12	1.3	0.2	1072	0	14	0	6.1	0.5
EDW	89	2	7	1.9	-0.3	72	0	4	0	5.5	0.9
EEZ	89	0	8	1.6	0.7	61	0	10	0	7.4	0.4
EIA	235	0	11	1.7	0.3	235	0	100	0	14.1	1.8
ELY	79	3	3	1.6	0.4	84	1	6	0	8.1	-0.1
ETH	28	0	18	1.9	-0.3	28	0	18	0	6.4	1.5
EVA	98	1	10	1.2	0.1	102	2	15	0	8.2	1.2
EWW	61	0	10	2.1	-0.3	59	0	7	0	7.2	1.5
FDX	1824	0	41	1.4	0.3	1834	0	41	0	7.1	1.0
FIN	251	0	3	1.5	0.1	232	0	6	0	8.3	0.7
FJI	822	0	47	1.6	0.7	803	0	47	0	7.5	1.1
FOM	593	0	32	1.1	0.2	589	0	32	0	6.1	0.5

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
GCO	231	0	16	1.9	0.6	218	0	100	0	14.3	4.1
GHA	41	2	2	1.4	-0.6	31	0	6	0	10.0	2.1
GRL	32	0	0	1.5	0.1	29	0	0	0	4.5	1.7
GTI	193	0	5	1.5	-0.3	196	0	6	0	7.9	1.1
HAL	3659	1	38	1.4	0.1	3633	0	39	0	8.4	0.7
IBE	2808	0	6	1.5	0.4	1760	0	9	0	7.5	0.5
ICE	856	0	4	1.5	-0.1	808	0	5	0	6.8	1.1
IWD	120	1	9	1.9	-0.1	75	0	11	0	8.7	2.1
JAA	51	4	8	2.4	0.8	51	0	2	0	7.6	2.8
JAL	2269	0	4	1.6	0.4	2253	0	5	0	8.2	0.7
JAZ	853	1	6	1.9	1.0	855	0	6	0	7.8	0.9
JMC	58	0	7	1.5	0.4	47	0	4	0	5.6	0.9
KAI	25	0	44	1.7	0.7	25	0	48	0	9.8	0.7
KAL	2900	1	9	1.7	0.1	2889	0	9	0	7.9	0.9
KIW	20	0	50	2.8	1.8	20	15	50	0	5.5	1.8
KLM	1769	0	4	1.5	0.2	1406	0	4	0	6.6	0.8
LAN	88	2	16	2.0	0.9	86	0	15	0	12.4	3.5
LAP	72	0	42	2.2	0.9	66	0	44	0	9.9	1.3
LDA	108	0	7	1.1	-0.2	88	0	9	0	7.7	0.6
LDI	621	1	58	1.6	-0.1	437	0	6	0	8.2	-0.4
LIB	747	0	6	1.5	0.6	492	0	8	0	7.3	0.4
LOT	152	1	3	1.6	-0.8	145	0	3	0	6.0	0.9
LTU	859	0	4	1.4	0.0	662	0	6	0	7.0	0.7
LXJ	22	0	45	1.0	0.0	22	0	45	0	4.4	0.2
MAS	306	0	6	1.6	-0.3	310	0	5	0	7.4	0.6
MON	123	1	2	1.2	0.0	92	0	1	0	5.8	0.2
MPD	263	1	5	1.5	-0.1	168	0	8	0	9.7	1.4
MPH	538	1	6	1.7	-0.7	477	0	6	0	7.1	0.3
NCA	715	1	4	1.7	0.2	562	0	5	0	7.8	0.3
NGA	57	0	9	3.4	2.7	40	0	5	0	9.4	2.2
NWA	8384	0	10	1.5	0.4	8369	0	10	0	7.6	0.6
NZL	3333	0	13	1.1	0.3	3333	0	13	0	5.3	0.3
OAE	186	0	40	1.4	-0.4	188	0	43	0	6.9	-0.4
PAC	406	0	26	1.8	-0.5	405	0	26	0	6.9	1.0
PAL	1131	0	9	1.4	-0.4	1095	0	10	0	7.4	0.9
PAO	294	0	53	1.7	0.3	290	1	53	0	7.1	2.7
PUA	38	0	37	3.0	0.0	37	0	30	0	14.6	-2.5
QFA	2854	0	50	1.4	0.3	2852	0	49	0	6.2	0.6
RAF	50	2	2	1.9	1.4	49	0	0	0	7.3	2.1
RAM	42	0	10	2.1	-0.5	25	0	8	0	8.5	0.4
RCH	434	3	100	2.5	-0.2	392	1	100	0	12.6	1.6
RJA	20	0	0	1.2	-0.1	26	0	4	0	11.4	-1.8
RRR	47	6	17	1.6	0.1	41	0	12	0	7.6	1.7
RYN	268	1	45	1.1	0.4	264	1	45	0	7.6	0.5
RZO	316	0	60	3.1	1.3	129	0	2	0	7.0	0.7
SAA	283	0	2	1.3	-0.7	223	0	4	0	9.0	1.3
SHE	22	0	5	2.5	0.8	23	0	9	0	9.7	1.1
SIA	277	0	1	1.4	0.3	276	0	3	0	6.8	0.5
SLR	259	0	11	1.4	0.2	233	0	11	0	5.6	0.1
SOO	21	10	62	5.7	4.7	23	0	9	0	7.6	1.5
SQC	42	0	0	1.1	0.6	43	0	0	0	5.5	0.4
SSV	20	5	15	1.4	-0.6	20	0	5	0	3.3	1.4
SVA	51	0	10	2.2	0.8	53	0	9	0	8.0	-0.1
TAG	48	2	35	2.5	1.4	45	0	33	0	6.3	1.3
TAP	594	1	4	1.5	-0.3	204	0	6	0	7.9	0.4
THA	117	0	9	1.3	-0.6	117	0	9	0	6.9	1.6
THT	93	2	37	2.2	0.3	92	0	35	0	11.4	3.5
TPA	32	0	6	1.1	0.4	26	0	8	0	7.2	-1.4
TSC	59	0	3	1.2	-0.1	51	0	6	0	9.0	-1.3

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
UAL	146871	0	97	1.1	-0.1	146684	0	97	0	5.1	0.6
UPS	1724	1	56	1.9	0.6	1705	0	55	0	7.4	0.6
USA	182	1	5	1.4	-0.1	142	0	5	0	7.1	1.0
VIR	369	1	4	1.6	0.1	363	0	5	0	8.6	1.1
VRG	143	1	27	3.0	1.5	132	3	100	0	12.6	-0.5
VVJ	43	7	37	2.2	-0.9	43	0	30	0	7.1	0.6
VVR	82	1	35	2.5	1.1	90	0	32	0	9.9	2.2
WOA	160	1	4	1.4	0.4	152	0	9	0	7.9	0.8
YSS	133	0	6	2.0	1.0	103	1	7	0	8.2	0.4
AU	32953	0	11	1.3	0.6	32955	0	11	0	5.2	0.5
EU	100329	0	33	1.3	0.3	100328	0	32	0	4.6	0.6
KL	1700	0	12	1.3	0.7	1697	0	12	0	5.0	1.0
MK	5222	0	7	1.9	1.5	5202	0	7	0	6.9	1.6
SA	6069	0	54	1.8	1.4	6057	0	10	0	5.9	0.6
WA	326	2	13	1.9	0.7	324	1	12	0	7.7	0.7
XX	3690	1	9	1.4	0.3	3673	0	10	0	8.8	1.3
N	741	2	33	2.3	0.5	768	0	31	0	7.8	0.5
US ACARS	838323	1	59	1.3	0.4	838317	0	59	0	5.3	0.9

TABLE 4B

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: April 2002

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :1000.0 – 300.1 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP $\geq$ 20

NB : All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	185	1	38	1.5	0.1	176	0	38	0	6.2	0.5
AAR	38	0	26	1.8	-1.1	37	0	27	0	11.2	-0.8
AFR	110	0	11	1.3	0.0	97	0	11	0	6.1	0.7
ANZ	99	8	27	1.1	0.0	103	0	25	0	7.9	1.6
BAF	27	0	0	1.6	-0.2	27	0	0	0	6.6	1.6
CFC	74	1	5	1.7	0.8	58	0	7	0	6.8	1.6
CFG	45	0	4	1.8	-0.9	32	0	0	0	4.8	0.2
COA	127	0	48	1.3	-0.1	127	0	49	0	7.5	0.5
CRL	31	0	6	1.2	0.4	22	0	14	0	7.0	-1.3
CUB	55	0	2	1.6	0.8	39	0	5	0	9.2	-0.6
DAL	236	1	58	1.4	0.1	236	0	58	0	6.5	1.1
DHL	41	0	54	5.3	-4.5	40	0	5	0	9.5	0.5
DLH	183	0	10	1.2	0.2	182	0	12	0	6.5	0.6
EWW	65	0	5	1.3	0.6	68	0	15	0	13.5	2.8
FDX	341	0	33	1.4	0.5	338	0	33	0	8.0	0.5
FXI	23	0	9	3.1	2.4	21	0	0	0	8.7	1.3
GCO	266	0	4	1.7	0.7	268	0	100	0	16.3	4.5
GHA	29	0	10	1.2	-0.5	25	0	12	0	7.3	1.0
GTI	33	0	9	1.1	0.1	34	0	12	0	7.5	-0.8
HAL	50	8	44	2.1	0.0	48	0	40	0	8.3	2.4
IBE	56	4	14	1.6	-0.5	49	0	16	0	7.0	2.5
ICE	58	2	3	1.4	-0.3	50	2	2	0	4.4	0.2
JAA	39	5	8	2.0	0.6	39	0	5	0	8.0	2.2
JAL	132	0	5	1.5	0.1	132	0	4	0	6.4	1.9
JAZ	153	0	3	1.8	1.0	152	0	3	0	7.5	0.1
KAL	60	3	27	1.7	-0.4	60	0	25	0	6.6	-0.4
KIW	54	9	48	2.8	0.1	54	0	41	0	7.6	-0.1
KLM	86	0	6	1.7	-0.1	65	0	6	0	6.4	1.5
LAN	112	4	17	3.1	0.6	126	0	7	0	11.0	3.0
LIB	48	2	10	1.2	0.9	36	0	11	0	5.0	-0.4
MPH	51	0	2	1.6	-0.4	48	0	0	0	5.7	0.4
NCA	87	0	2	1.7	-0.1	51	0	4	0	7.6	0.4
NWA	407	1	7	1.6	0.5	403	0	8	0	8.4	0.2
NZL	17948	0	58	1.4	0.4	17948	0	58	0	4.5	0.5
PAC	31	0	19	1.9	-0.2	34	0	18	0	6.6	2.0
PAL	32	0	3	2.3	-1.3	30	0	0	0	8.2	2.4
QFA	105	4	39	1.7	0.3	105	0	38	0	4.8	0.0
RCH	126	0	100	4.2	-2.2	105	0	100	0	13.2	3.9
RRR	189	2	24	3.3	1.7	180	1	15	0	10.3	0.3
SAA	49	0	0	1.1	-0.8	49	0	2	0	8.9	-1.0
SIA	32	0	6	1.0	0.4	32	0	6	0	7.0	-0.6
UAL	265487	0	99	1.2	0.0	265187	0	99	0	4.4	0.3
UPS	132	0	48	2.0	0.1	131	2	48	0	6.1	0.3
VTA	20	5	25	2.8	-1.5	25	0	8	0	5.1	1.4
VVP	84	2	54	3.4	1.4	84	0	57	0	12.7	2.3
VVR	31	0	32	2.2	-0.2	40	0	30	0	6.4	0.5
WOA	21	0	0	1.2	0.3	21	0	14	0	12.1	3.5
AU	20145	0	50	1.1	0.4	20148	0	50	0	3.9	0.3
EU	517522	0	70	1.0	0.2	514917	0	70	0	3.9	0.1
KL	1607	0	56	1.3	0.6	1599	0	56	0	4.3	0.4
MK	3270	0	54	1.4	0.8	3255	0	54	0	4.8	0.7
SA	4893	0	79	1.7	0.8	4883	0	60	0	4.6	0.8
WA	68	4	13	1.4	0.5	67	3	16	0	6.0	1.5
XX	905	4	11	1.7	0.1	906	1	12	0	11.5	2.0
N	21	10	29	4.2	1.9	21	0	19	0	13.4	1.0
	531	0	89	1.1	0.2	531	0	89	0	4.2	-0.2
US ACARS	1594992	0	79	1.3	0.3	1589689	0	79	0	4.3	0.2

Figure 3a. AIRCRAFT 300 - 150 hPa mean daily count. APRIL 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Global average number of observations in 24 hours = 40344

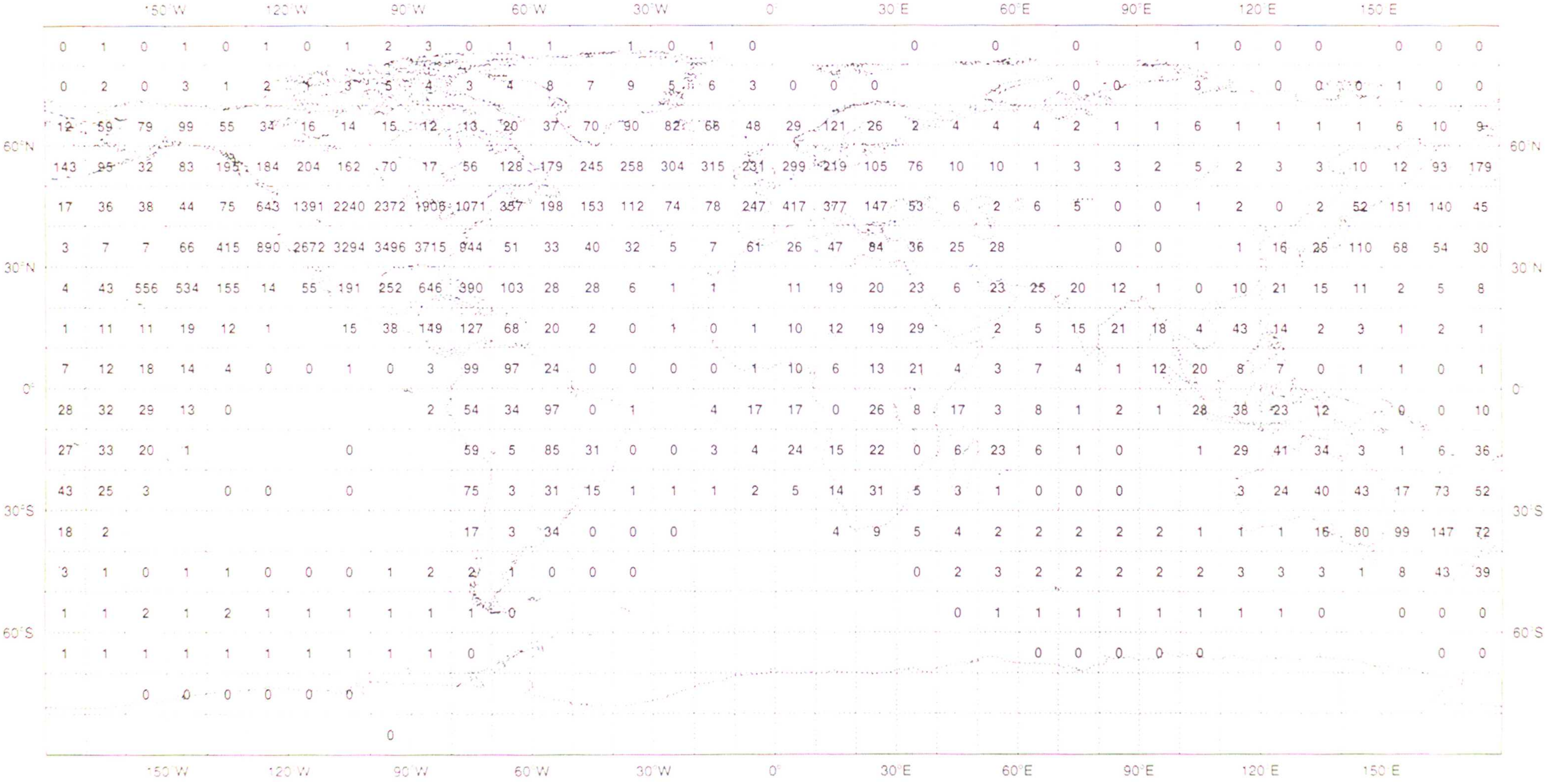

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
0 1 0 1 0 1 0 1 2 3 0 1 1 1 0 1 0 0 0 0 1 0 0 0 0 0 0
0 2 0 3 1 2 3 5 4 3 4 8 7 9 5 6 3 0 0 0 0 0 3 0 0 0 1 0 0
12 59 79 99 55 34 16 14 15 12 13 20 37 70 90 82 68 48 29 121 26 2 4 4 4 2 1 1 6 1 1 1 1 6 10 9
143 95 32 83 195 184 204 162 70 17 56 128 179 245 258 304 315 231 299 219 105 76 10 10 1 3 3 2 5 2 3 3 10 12 93 179
17 36 38 44 75 643 1391 2240 2372 1906 1071 357 198 153 112 74 78 247 417 377 147 53 6 2 6 5 0 0 1 2 0 2 52 151 140 45
3 7 7 66 415 890 2672 3294 3496 3715 944 51 33 40 32 5 7 61 26 47 84 36 25 28 0 0 1 16 25 110 68 54 30
4 43 556 534 155 14 55 191 252 646 390 103 28 28 6 1 1 11 19 20 23 6 23 25 20 12 1 0 10 21 15 11 2 5 8
1 11 11 19 12 1 15 38 149 127 68 20 2 0 1 0 1 10 12 19 29 2 5 15 21 18 4 43 14 2 3 1 2 1
7 12 18 14 4 0 0 1 0 3 99 97 24 0 0 0 0 1 10 6 13 21 4 3 7 4 1 12 20 8 7 0 1 1 0 1
28 32 29 13 0 2 54 34 97 0 1 4 17 17 0 26 8 17 3 8 1 2 1 28 38 23 12 0 0 10
27 33 20 1 0 59 5 85 31 0 0 3 4 24 15 22 0 6 23 6 1 0 1 29 41 34 3 1 6 36
43 25 3 0 0 0 75 3 31 15 1 1 1 2 5 14 31 5 3 1 0 0 0 3 24 40 43 17 73 52
18 2 17 3 34 0 0 0 4 9 5 4 2 2 2 2 2 1 1 1 16 80 99 147 72
3 1 0 1 1 0 0 0 1 2 2 1 0 0 0 0 2 3 2 2 2 2 2 3 3 3 1 8 43 39
1 1 2 1 2 1 1 1 1 1 1 0 0 1 1 1 1 1 1 1 1 0 0 0 0
1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0
0 0 0 0 0 0
0

Figure 3b. AIRCRAFT 1000 - 301 hPa mean daily count. APRIL 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Global average number of observations in 24 hours = 80787

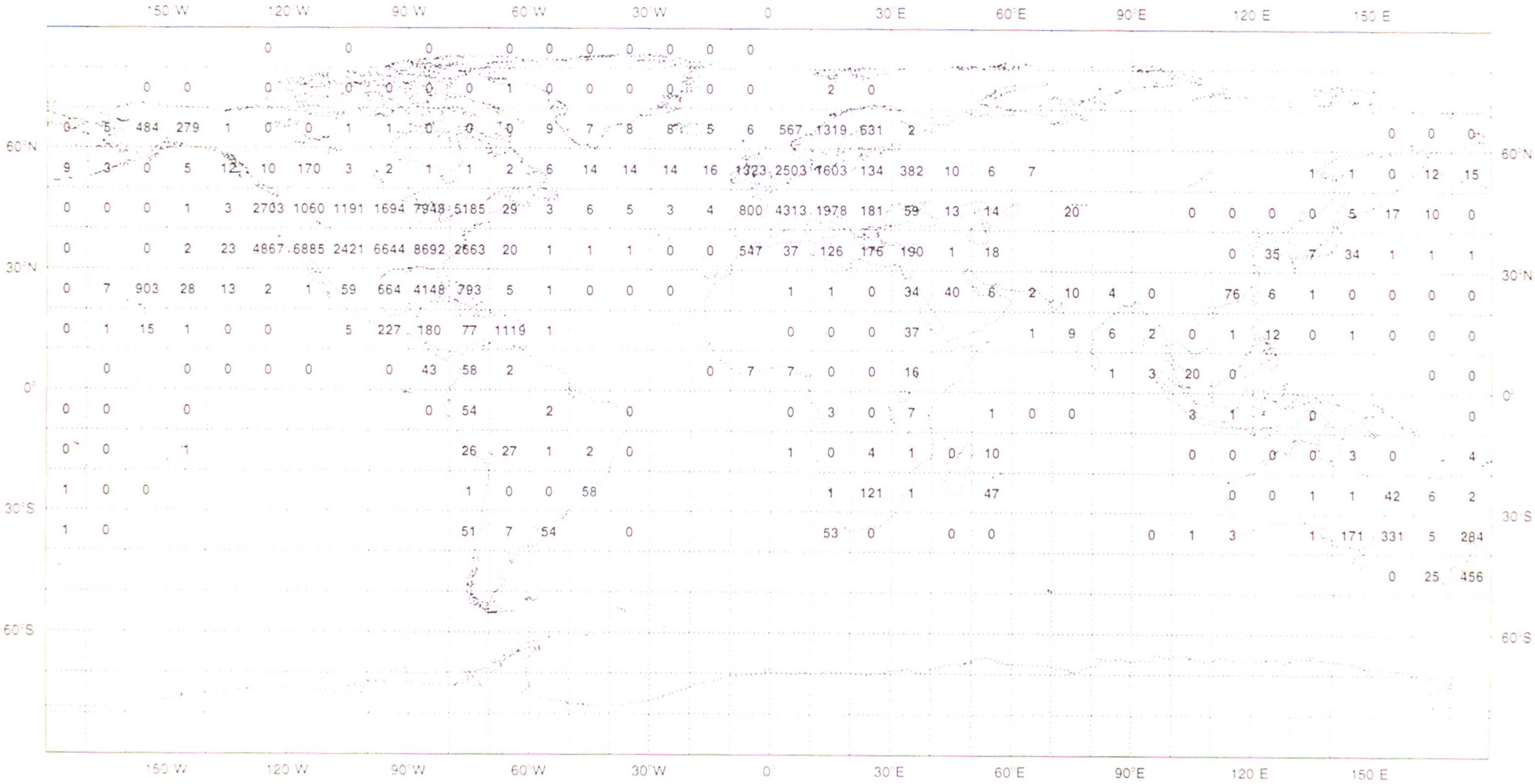

150 W
120 W
90 W
60 W
30 W
0
30 E
60 E
90 E
120 E
150 E
60 N
30 N
0
30 S
60 S
0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 1 0 0 0 0 0 0 2 0
0 5 484 279 1 0 0 1 1 0 0 0 9 7 8 8 5 6 567 1319 631 2 0 0 0
9 3 0 5 12 10 170 3 2 1 1 2 6 14 14 14 16 1323 2503 1603 134 382 10 6 7 1 1 0 12 15
0 0 0 1 3 2703 1060 1191 1694 7948 5185 29 3 6 5 3 4 800 4313 1978 181 59 13 14 20 0 0 0 0 5 17 10 0
0 0 2 23 4867 6885 2421 6644 8692 2663 20 1 1 1 0 0 547 37 126 176 190 1 18 0 35 7 34 1 1 1
0 7 903 28 13 2 1 59 664 4148 793 5 1 0 0 0 1 1 0 34 40 6 2 10 4 0 76 6 1 0 0 0 0
0 1 15 1 0 0 5 227 180 77 1119 1 0 0 0 37 1 9 6 2 0 1 12 0 1 0 0 0
0 0 0 0 0 0 43 58 2 0 7 7 0 0 16 1 3 20 0 0 0
0 0 0 0 54 2 0 0 3 0 7 1 0 0 3 1 0 0
0 0 1 26 27 1 2 0 1 0 4 1 0 10 0 0 0 0 3 0 4
1 0 0 1 0 0 58 1 121 1 47 0 0 1 1 42 6 2
1 0 51 7 54 0 53 0 0 0 0 1 3 1 171 331 5 284
0 25 456

Figure 4a. AIRCRAFT 300 - 150 hPa mean winds. APRIL 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

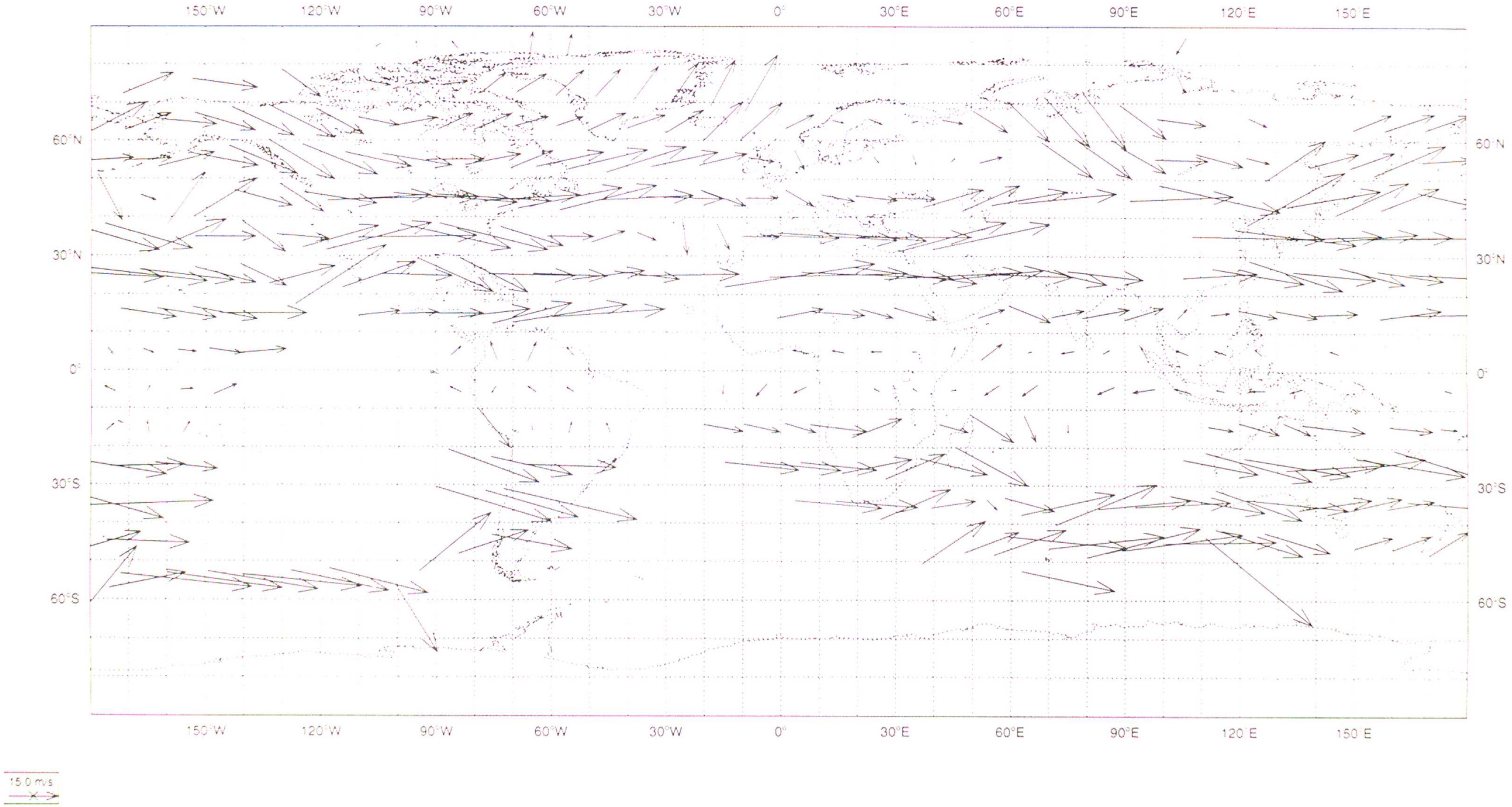

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0 m/s

Figure 4b. AIRCRAFT 1000 - 301 hPa mean winds. APRIL 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

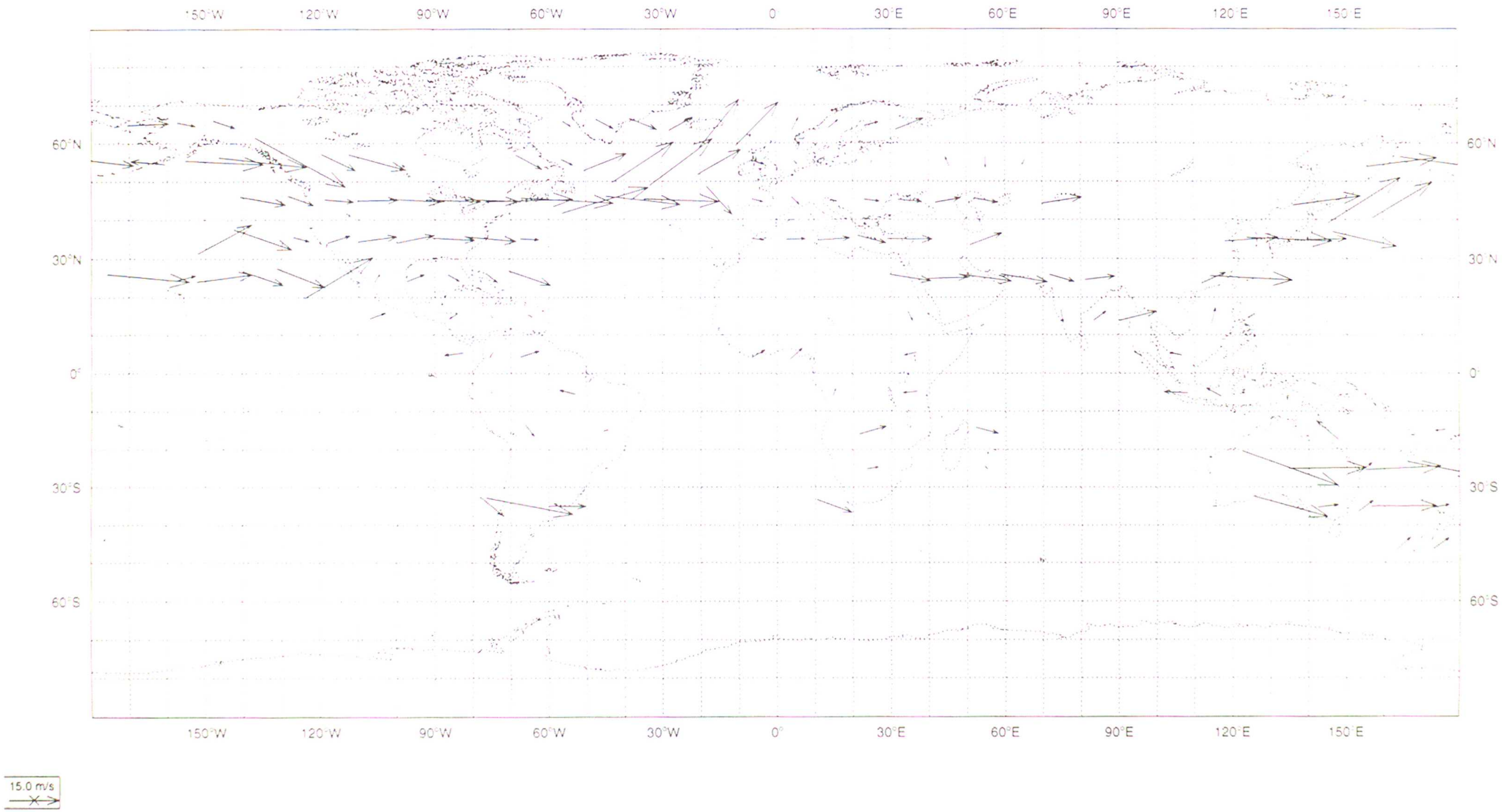

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0 m/s

Figure 5a. AIRCRAFT 300 - 150 hPa mean O-B winds. APRIL 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

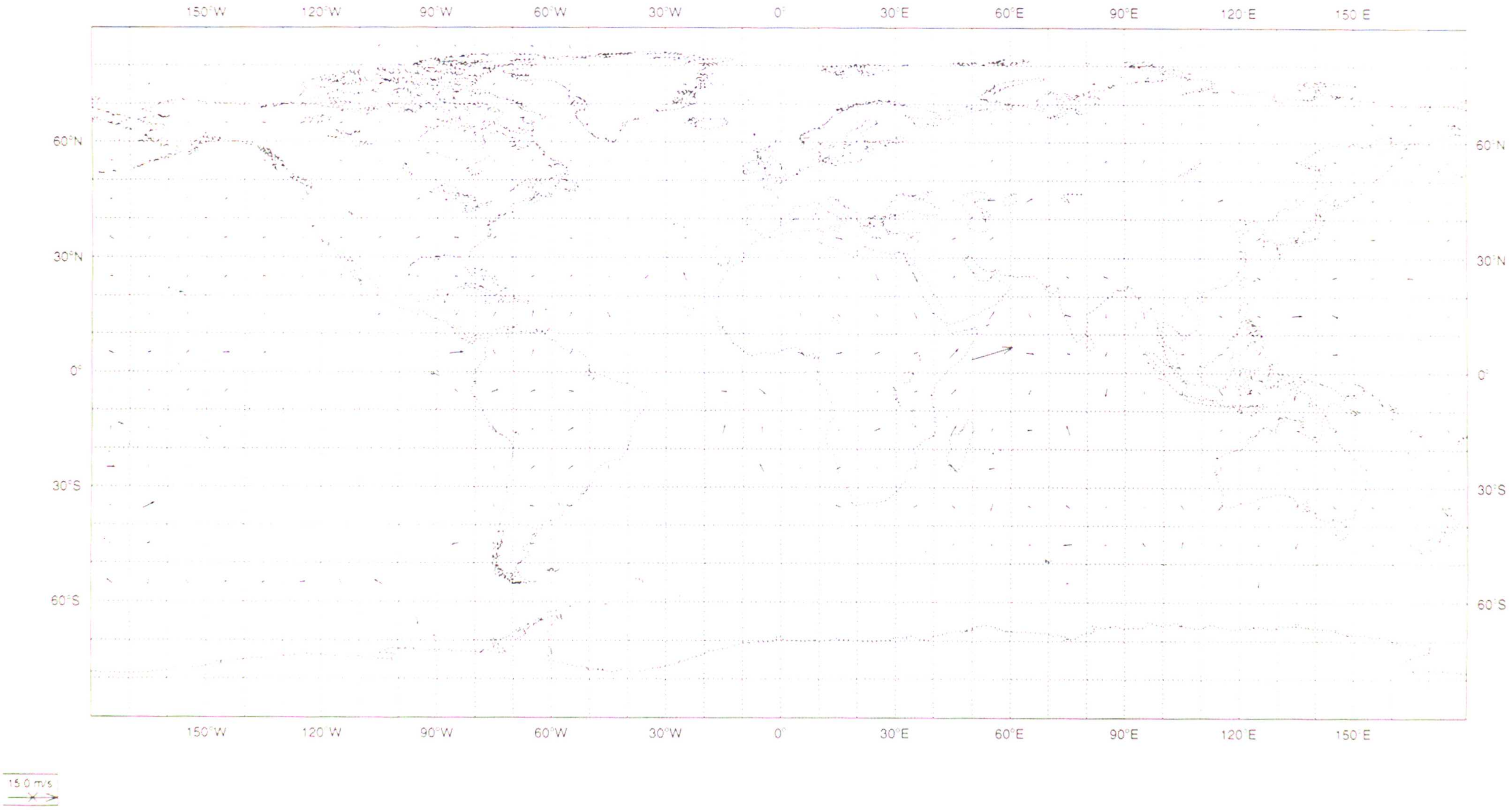

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0 m/s

Figure 5b. AIRCRAFT 1000 - 301 hPa mean O-B winds. APRIL 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

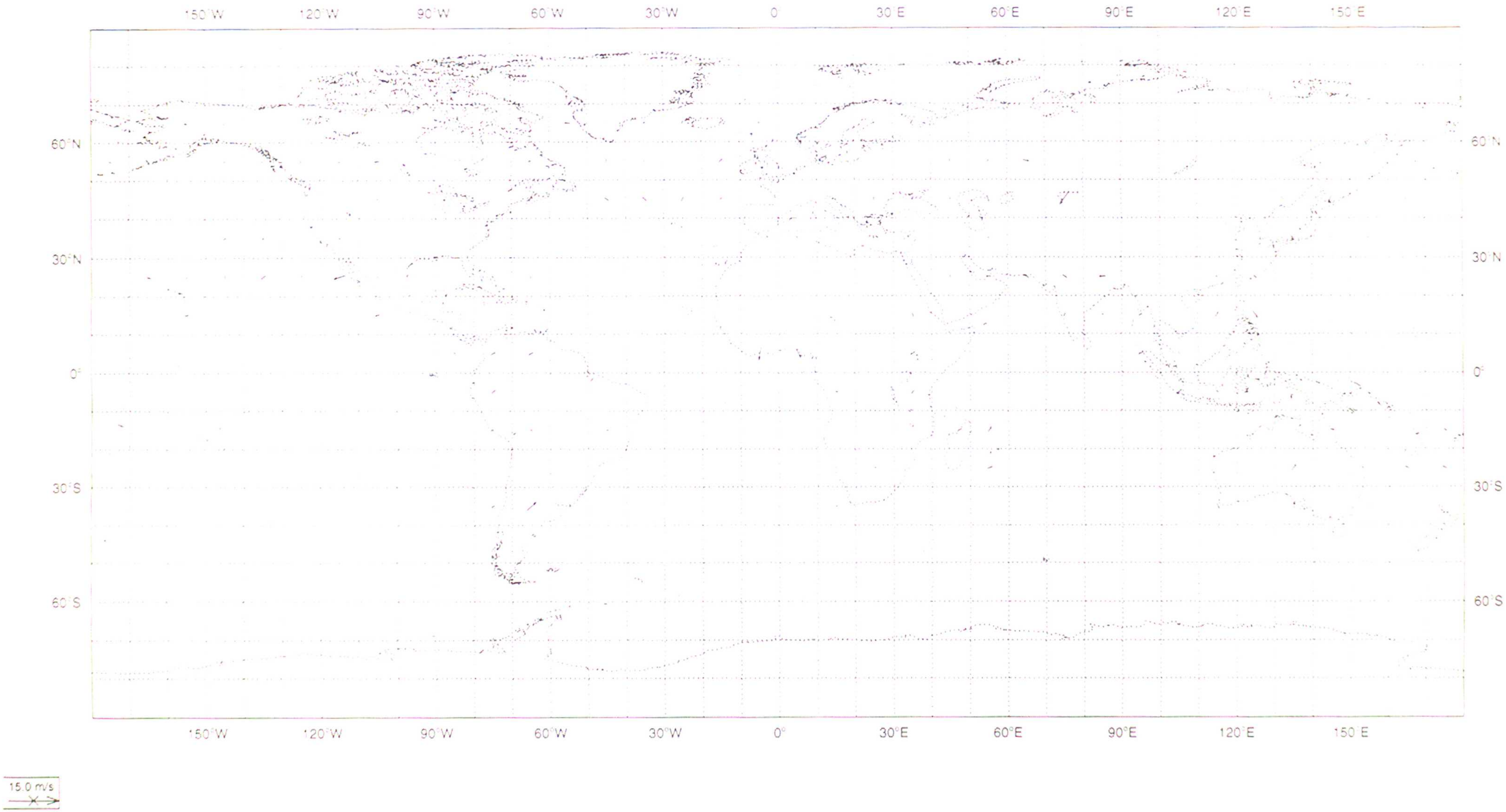

150°W
120°W
90°W
60°W
30°W
0
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0 m/s

Figure 6a. AIRCRAFT 300 - 150 hPa mean O-B speeds (ms-1). APRIL 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

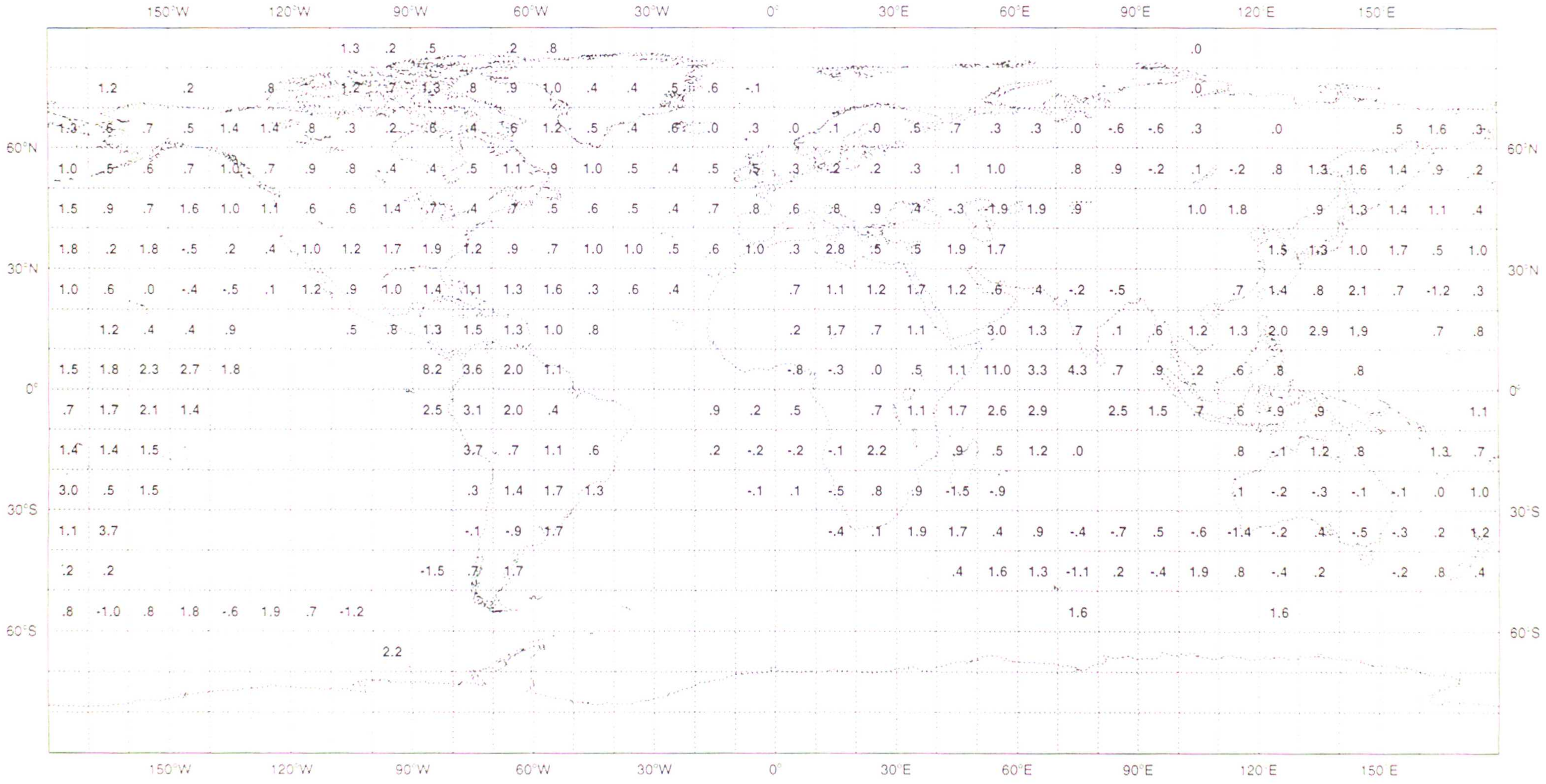

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
1.3 .2 .5 .2 .8 .0
1.2 .2 .8 1.2 .7 1.3 .8 .9 1.0 .4 .4 .5 .6 -.1 .0
1.3 .6 .7 .5 1.4 1.4 .8 .3 .2 .6 .4 .6 1.2 .5 .4 .6 .0 .3 .0 .1 .0 .5 .7 .3 .3 .0 -.6 -.6 .3 .0 .5 1.6 .3
1.0 .5 .6 .7 1.0 .7 .9 .8 .4 .4 .5 1.1 .9 1.0 .5 .4 .5 .5 .3 .2 .2 .3 .1 1.0 .8 .9 -.2 .1 -.2 .8 1.3 1.6 1.4 .9 .2
1.5 .9 .7 1.6 1.0 1.1 .6 .6 1.4 .7 .4 .7 .5 .6 .5 .4 .7 .8 .6 .8 .9 .4 -.3 1.9 1.9 .9 1.0 1.8 .9 1.3 1.4 1.1 .4
1.8 .2 1.8 -.5 .2 .4 1.0 1.2 1.7 1.9 1.2 .9 .7 1.0 1.0 .5 .6 1.0 .3 2.8 .5 .5 1.9 1.7 1.5 1.3 1.0 1.7 .5 1.0
1.0 .6 .0 -.4 -.5 .1 1.2 .9 1.0 1.4 1.1 1.3 1.6 .3 .6 .4 .7 1.1 1.2 1.7 1.2 .6 .4 -.2 -.5 .7 1.4 .8 2.1 .7 -1.2 .3
1.2 .4 .4 .9 .5 .8 1.3 1.5 1.3 1.0 .8 .2 1.7 .7 1.1 3.0 1.3 .7 .1 .6 1.2 1.3 2.0 2.9 1.9 .7 .8
1.5 1.8 2.3 2.7 1.8 8.2 3.6 2.0 1.1 -.8 -.3 .0 .5 1.1 11.0 3.3 4.3 .7 .9 .2 .6 .8 .8
.7 1.7 2.1 1.4 2.5 3.1 2.0 .4 .9 .2 .5 .7 1.1 1.7 2.6 2.9 2.5 1.5 .7 .6 .9 .9 1.1
1.4 1.4 1.5 3.7 .7 1.1 .6 .2 -.2 -.2 -.1 2.2 .9 .5 1.2 .0 .8 -.1 1.2 .8 1.3 .7
3.0 .5 1.5 .3 1.4 1.7 1.3 -.1 .1 -.5 .8 .9 -1.5 -.9 .1 -.2 -.3 -.1 -.1 .0 1.0
1.1 3.7 -.1 -.9 1.7 -.4 .1 1.9 1.7 .4 .9 -.4 -.7 .5 -.6 -1.4 -.2 .4 -.5 -.3 .2 1.2
.2 .2 -1.5 .7 1.7 .4 1.6 1.3 -1.1 .2 -.4 1.9 .8 -.4 .2 -.2 .8 .4
.8 -1.0 .8 1.8 -.6 1.9 .7 -1.2 1.6 1.6
2.2

Figure 6b. AIRCRAFT 1000 - 301 hPa mean O-B speeds (ms-1). APRIL 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

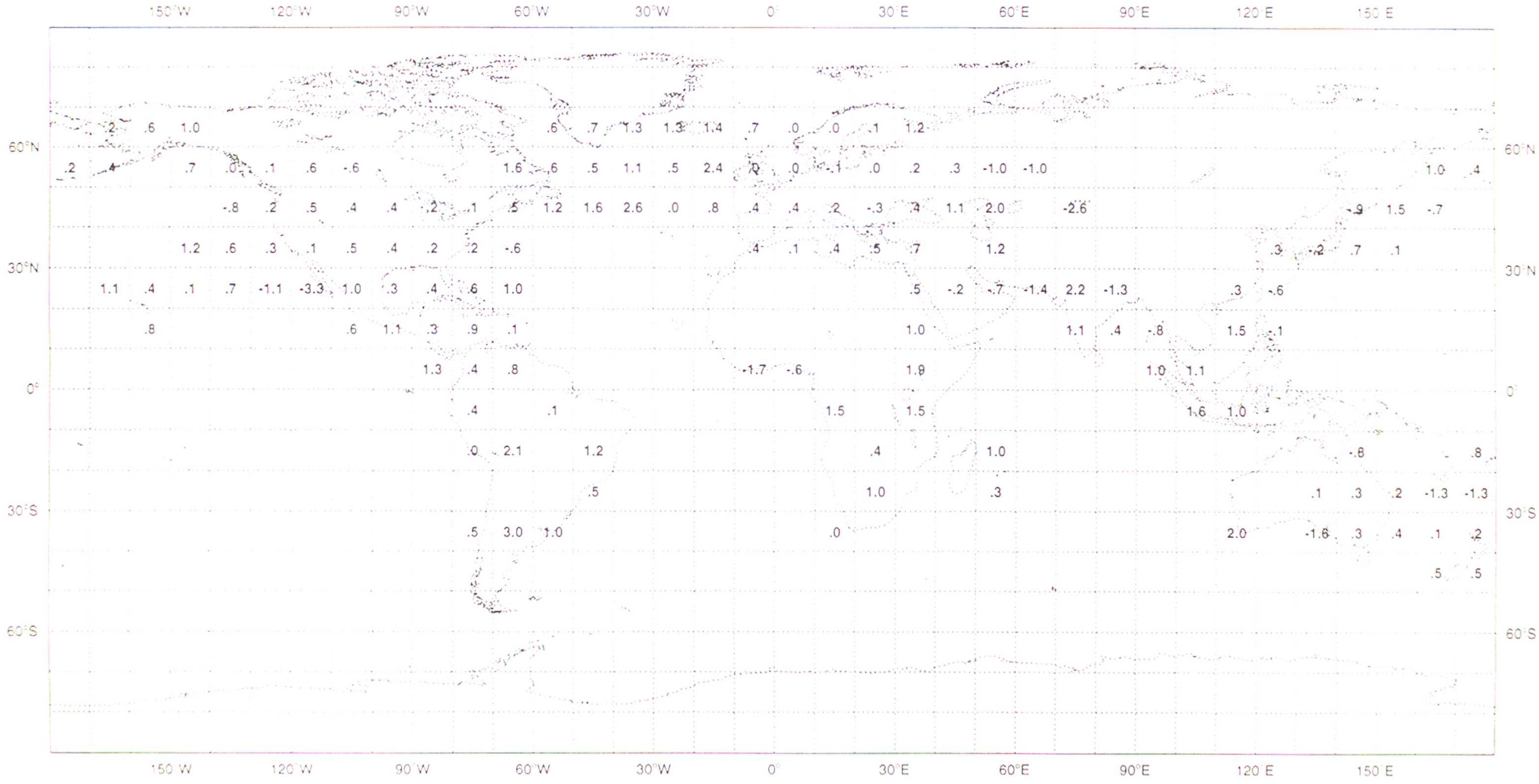

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.2 .6 1.0 .6 .7 1.3 1.3 1.4 .7 .0 .0 .1 1.2
.2 .4 .7 .0 .1 .6 -.6 1.6 .6 .5 1.1 .5 2.4 .0 .0 -.1 .0 .2 .3 -1.0 -1.0 1.0 .4
-.8 .2 .5 .4 .4 .2 .1 .5 1.2 1.6 2.6 .0 .8 .4 .4 .2 -.3 .4 1.1 2.0 -2.6 -.9 1.5 -.7
1.2 .6 .3 .1 .5 .4 .2 .2 -.6 .4 .1 .4 .5 .7 1.2 .3 -.2 .7 .1
1.1 .4 .1 .7 -1.1 -3.3 1.0 .3 .4 .6 1.0 .5 -.2 -.7 -1.4 2.2 -1.3 .3 -.6
.8 .6 1.1 .3 .9 .1 1.0 1.1 .4 -.8 1.5 -.1
1.3 .4 .8 -1.7 -.6 1.9 1.0 1.1
.4 .1 1.5 1.5 1.6 1.0
.0 2.1 1.2 .4 1.0 -.8 .8
.5 1.0 .3 .1 .3 .2 -1.3 -1.3
.5 3.0 1.0 .0 2.0 -1.6 .3 .4 .1 .2
.5 .5

Figure 7a. AIRCRAFT 300 - 150 hPa RMS O-B vector (ms-1). APRIL 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

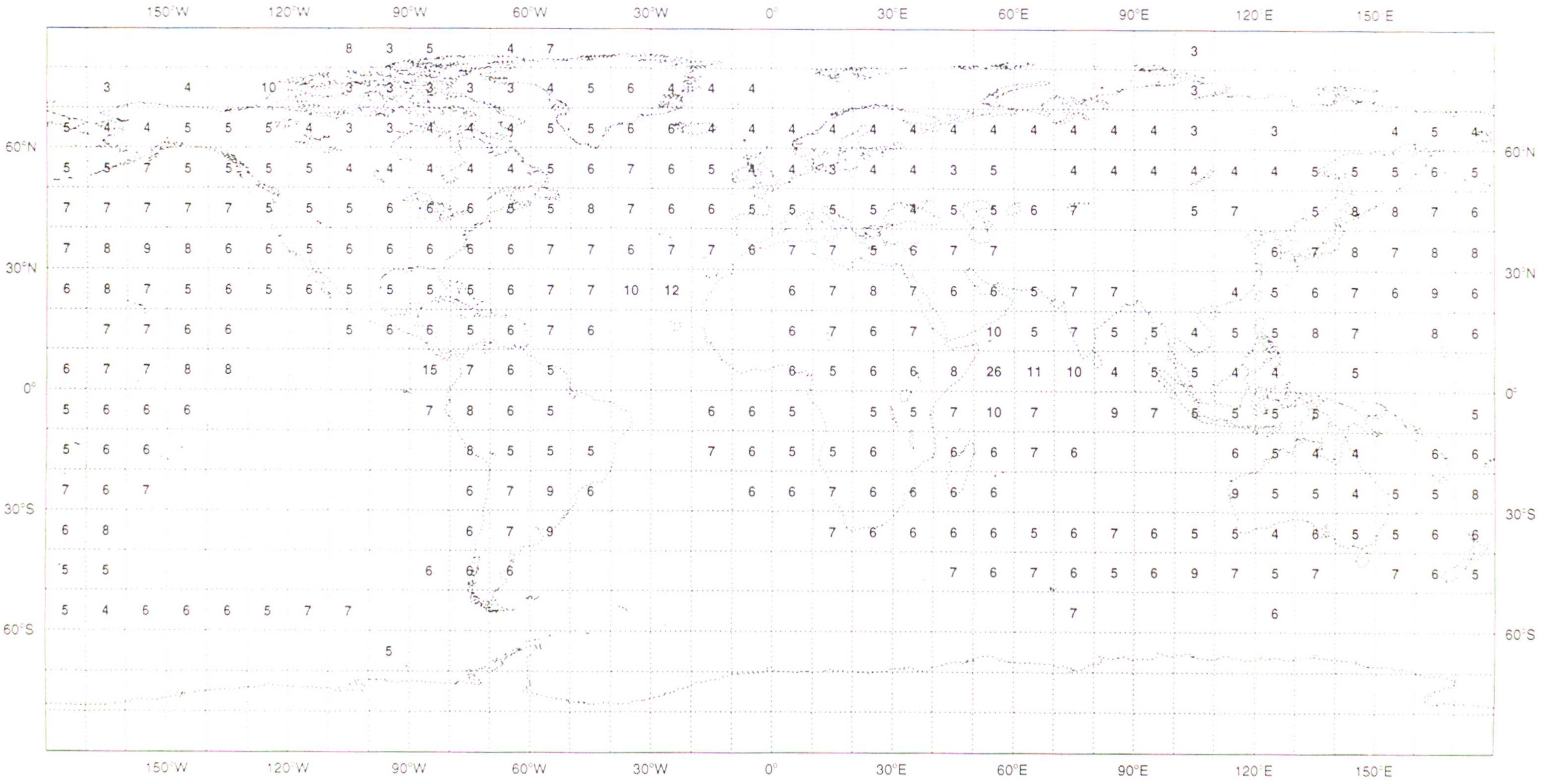

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
8 3 5 4 7 3
3 4 10 3 3 3 3 3 4 5 6 4 4 4 3
5 4 4 5 5 5 4 3 3 4 4 4 5 5 6 6 4 4 4 4 4 4 4 4 4 4 4 4 4 3 3 4 5 4
5 5 7 5 5 5 5 4 4 4 4 4 5 6 7 6 5 4 4 3 4 4 3 5 4 4 4 4 4 4 5 5 5 6 5
7 7 7 7 7 5 5 5 6 6 6 5 5 8 7 6 6 5 5 5 5 4 5 5 6 7 5 7 5 8 8 7 6
7 8 9 8 6 6 5 6 6 6 6 6 7 7 6 7 7 6 7 7 5 6 7 7 6 7 8 7 8 8
6 8 7 5 6 5 6 5 5 5 5 6 7 7 10 12 6 7 8 7 6 6 5 7 7 4 5 6 7 6 9 6
7 7 6 6 5 6 6 5 6 7 6 6 7 6 7 10 5 7 5 5 4 5 5 8 7 8 6
6 7 7 8 8 15 7 6 5 6 5 6 6 8 26 11 10 4 5 5 4 4 5
5 6 6 6 7 8 6 5 6 6 5 5 5 7 10 7 9 7 6 5 5 5 5
5 6 6 8 5 5 5 7 6 5 5 6 6 6 7 6 6 5 4 4 6 6
7 6 7 6 7 9 6 6 6 7 6 6 6 6 9 5 5 4 5 5 8
6 8 6 7 9 7 6 6 6 6 5 6 7 6 5 5 4 6 5 5 6 6
5 5 6 6 6 7 6 7 6 5 6 9 7 5 7 7 6 5
5 4 6 6 6 5 7 7 7 6
5
150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E

Figure 7b. AIRCRAFT 1000 - 301 hPa RMS O-B vector (ms-1). APRIL 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

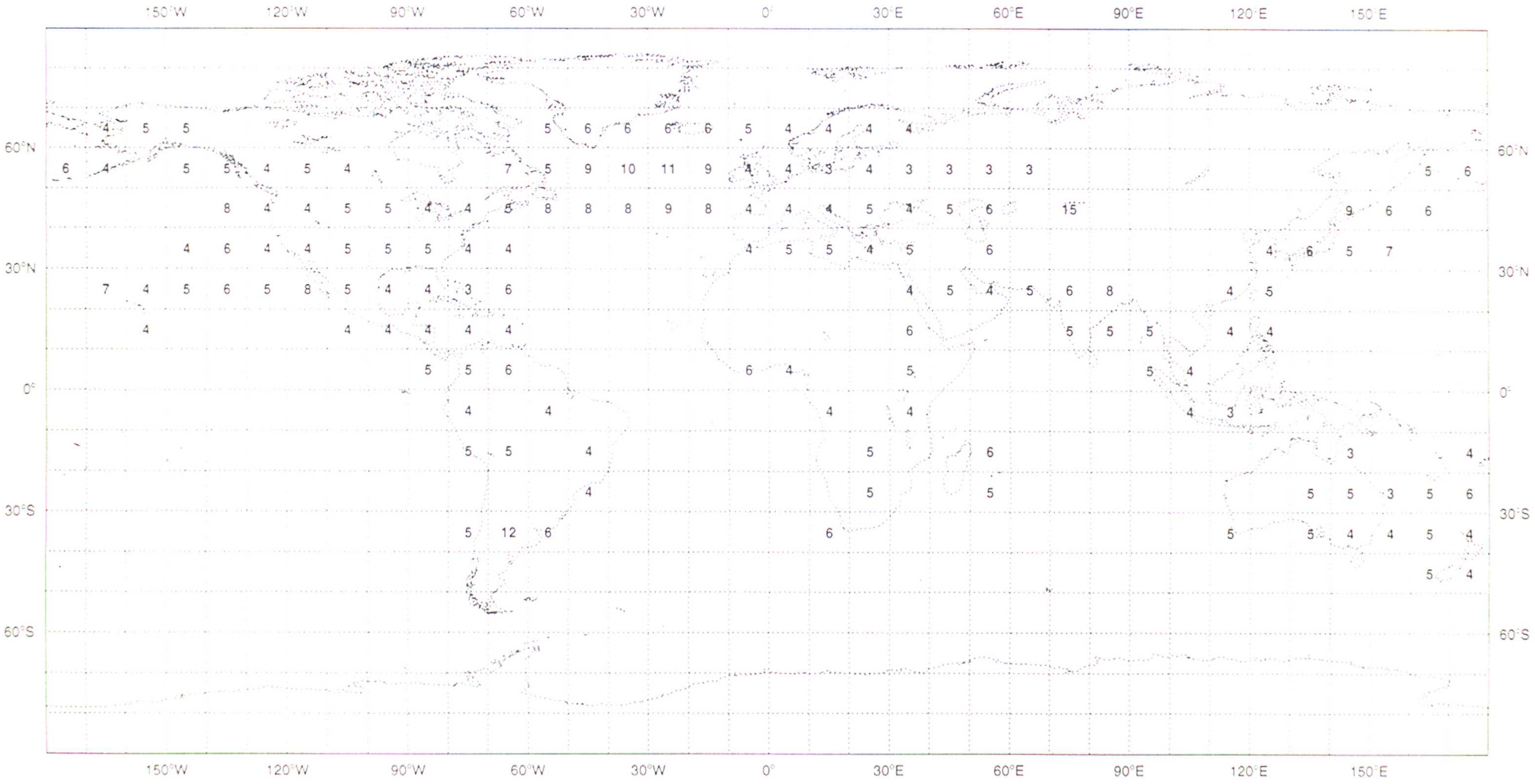

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
4 5 5 5 6 6 6 6 5 4 4 4 4
6 4 5 5 4 5 4 7 5 9 10 11 9 4 4 3 4 3 3 3 3 5 6
8 4 4 5 5 4 4 5 8 8 8 9 8 4 4 4 5 4 5 6 15 9 6 6
4 6 4 4 5 5 5 4 4 4 5 5 4 5 6 4 6 5 7
7 4 5 6 5 8 5 4 4 3 6 4 5 4 5 6 8 4 5
4 4 4 4 4 4 6 5 5 5 4 4
5 5 6 6 4 5 5 4
4 4 4 4 4 3
5 5 4 5 6 3 4
4 5 5 5 5 3 5 6
5 12 6 6 5 5 4 4 5 4
5 4

TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: April 2002

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 30.0 hPa
Element monitored		:GEOPOTENTIAL HEIGHT IN metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown duringperiod.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.1	
SELECTION CRITERIA	: ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS.	

ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
20674	12	Z	30	73/ 80	13	0	65.2	262.8	270.8	5
26477	12	Z	200	56/ 31	21	2	27.4	164.1	166.4	10
31168	00	Z	250	56/ 138	22	0	40.3	80.3	89.8	5
32098	00	Z	100	49/ 143	23	1	45.1	149.1	155.8	5
34247	12	Z	30	50/ 41	25	1	69.0	188.8	201.1	6
40394	12	Z	70	27/ 42	22	0	109.9	105.7	152.4	5
40430	12	Z	50	25/ 40	18	0	32.7	179.4	182.3	4
41112	12	Z	1000	18/ 43	17	0	23.2	-62.5	66.7	4
41594	12	Z	150	32/ 73	12	0	96.2	76.3	122.8	7
42027	00	Z	200	34/ 75	13	1	106.2	-1.7	106.2	6
42101	00	Z	200	30/ 76	23	3	66.3	-83.7	106.8	9
42101	12	Z	30	30/ 76	9	2	67.9	338.4	345.2	5
42182	00	Z	30	29/ 77	11	0	103.9	229.4	251.8	4
42339	00	Z	150	26/ 73	20	0	93.3	-52.7	107.2	4
42339	12	Z	400	26/ 73	24	0	56.8	19.9	60.2	4
42369	12	Z	50	27/ 81	16	1	87.5	178.5	198.8	7
42647	00	Z	100	23/ 73	12	0	102.0	-56.4	116.5	4
42647	12	Z	50	23/ 73	6	4	77.0	286.2	296.4	10
42724	12	Z	150	24/ 91	16	0	70.0	-110.8	131.0	5
43003	00	Z	100	19/ 73	16	0	113.3	-72.7	134.6	5
43014	00	Z	200	20/ 75	19	0	95.8	36.5	102.5	6
43014	12	Z	150	20/ 75	12	1	124.0	54.2	135.3	6
43185	12	Z	100	16/ 81	11	0	69.2	129.8	147.1	8
43192	00	Z	100	15/ 74	16	1	109.1	-189.9	219.0	6
43295	12	Z	30	13/ 78	7	3	84.9	277.9	290.5	5
43333	12	Z	100	12/ 93	17	0	88.1	-101.8	134.6	4
43346	00	Z	100	11/ 80	29	0	82.9	-125.5	150.4	5
43346	12	Z	30	11/ 80	24	1	97.6	287.5	303.6	5
43369	00	Z	150	8/ 73	17	0	57.6	-115.4	129.0	4
43369	12	Z	50	8/ 73	11	0	107.2	243.3	265.8	7
43371	00	Z	100	8/ 77	28	0	72.5	-149.6	166.2	5
43371	12	Z	30	8/ 77	14	0	108.6	265.6	286.9	8
61291	12	Z	200	13/ -8	1	0	0.0	89.0	89.0	6
83746	12	Z	50	-23/ -43	4	0	15.0	175.2	175.9	4
83840	12	Z	30	-26/ -49	4	0	35.6	223.2	226.1	4
89512	12	Z	30	-71/ 12	9	3	38.1	328.9	331.1	4
91366	00	Z	50	9/ 168	20	0	75.5	183.1	198.1	5
97180	00	Z	400	-5/ 120	13	0	40.3	-52.7	66.4	5

Figure 8. TEMP 500 hPa geopotential mean daily count. APRIL 2002
All hours
Global average number of observations in 24 hours = 1132

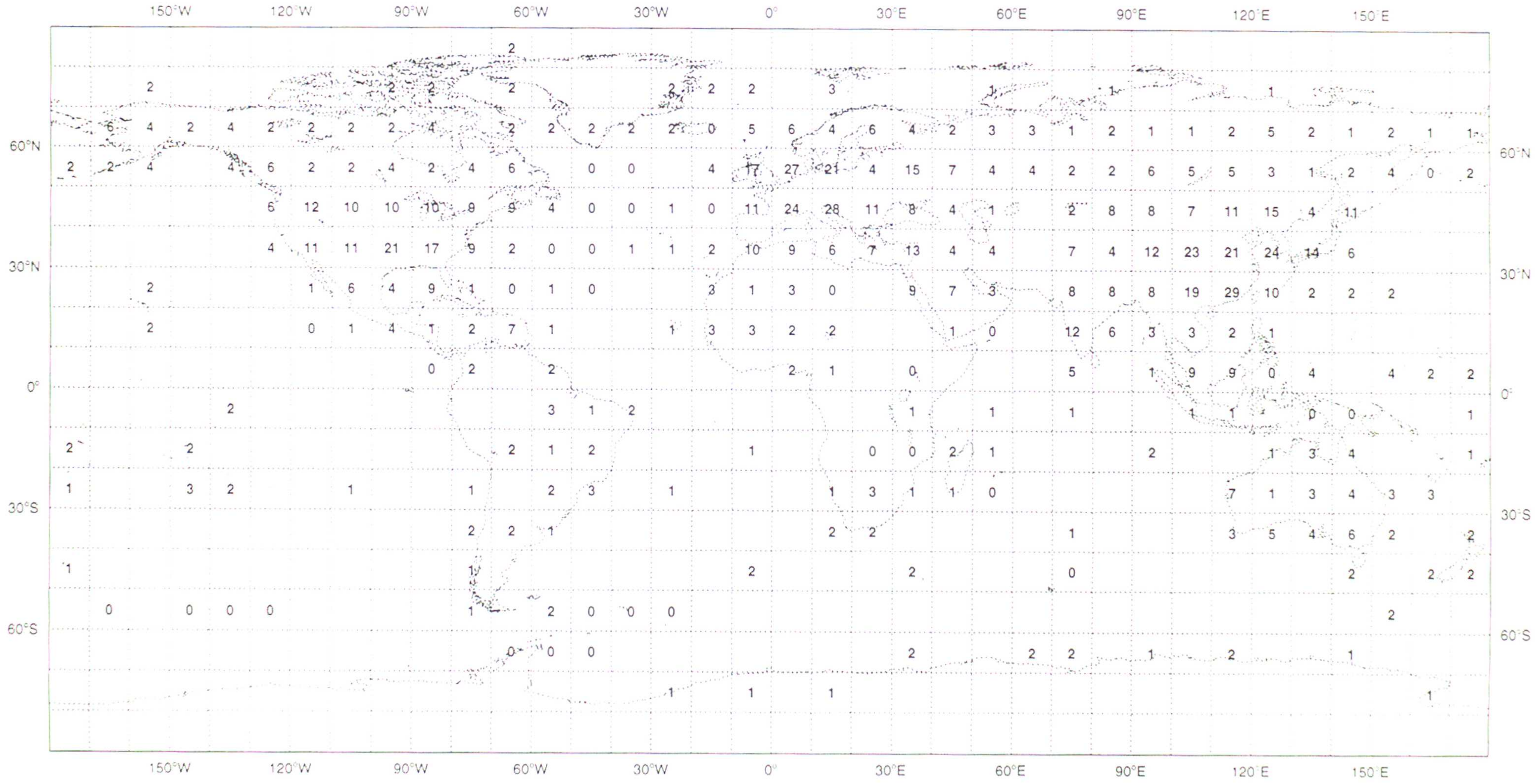

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
2
2 2 2 2 2 2 2 3 1 1 1
6 4 2 4 2 2 2 2 4 2 2 2 2 2 0 5 6 4 6 4 2 3 3 1 2 1 1 2 5 2 1 2 1 1
2 2 4 4 6 2 2 4 2 4 6 0 0 4 17 27 21 4 15 7 4 4 2 2 6 5 5 3 1 2 4 0 2
6 12 10 10 10 8 9 4 0 0 1 0 11 24 28 11 8 4 1 2 8 8 7 11 15 4 11
4 11 11 21 17 9 2 0 0 1 1 2 10 9 6 7 13 4 4 7 4 12 23 21 24 14 6
2 1 6 4 9 1 0 1 0 3 1 3 0 9 7 3 8 8 8 19 29 10 2 2 2
2 0 1 4 1 2 7 1 1 3 3 2 2 1 0 12 6 3 3 2 1
0 2 2 2 1 0 5 1 9 9 0 4 4 2 2
2 3 1 2 1 1 1 1 1 0 0 1
2 2 2 1 2 1 0 0 2 1 2 1 3 4 1
1 3 2 1 1 2 3 1 1 3 1 1 0 7 1 3 4 3 3
2 2 1 2 2 1 3 5 4 6 2 2
1 1 2 2 0 2 2 2
0 0 0 0 1 2 0 0 0 2
0 0 0 2 2 2 1 2 1
1 1 1 1

TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: April 2002

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 1000.0 - 100.0 hPa

Element monitored :VECTOR WIND in m s^{-1}

Parameters monitored

:NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:% REJ :Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.

:UBIAS,VBIAS :Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

:NUM LEVELS :Number of levels satisfying selection criteria.

GROSS ERROR LIMITS :Defined in Appendix I.2

SELECTION CRITERIA : $\geq$ 10 observations and $\geq$ 15 m s^{-1} RMS vector wind.

ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	% REJ	UBIAS	VBIAS	RMS	LEVELS
PSPIU	00	V	150	-5/ -81	29	0	100	3.0	-1.0	20.0	3
PSPIU	12	V	150	-5/ -81	24	0	100	-3.6	0.2	24.1	2
17351	12	V	250	37/ 35	28	0	100	-4.6	1.2	15.2	1
38341	00	V	250	43/ 71	15	0	100	-1.7	-16.6	20.1	3
41594	12	V	250	32/ 73	20	0	100	-13.8	6.1	25.0	4
42410	00	V	250	26/ 92	16	0	100	7.4	0.0	18.4	4
42410	12	V	400	26/ 92	18	0	100	7.7	1.8	18.3	3
42647	00	V	200	23/ 73	12	0	91	-8.0	3.9	25.4	4
42724	00	V	250	24/ 91	14	0	100	5.3	0.0	17.4	2
44259	00	V	300	48/ 115	27	0	18	7.3	-6.1	17.0	1
48407	12	V	150	15/ 105	23	0	100	-12.8	-3.6	15.9	1
48455	12	V	150	14/ 101	26	0	100	-11.8	-2.7	15.3	1
54135	12	V	250	44/ 122	28	0	14	-3.7	-4.7	15.6	1
60490	12	V	200	36/ -1	23	0	100	-7.9	2.8	16.0	3
60656	12	V	200	28/ -8	17	0	100	-9.8	-6.8	17.6	3
61641	12	V	150	15/ -17	21	0	9	-6.5	4.3	28.3	1
62337	00	V	150	31/ 34	26	0	100	-12.7	8.4	20.0	3
62337	12	V	150	31/ 34	28	0	100	-12.3	11.2	19.9	4
62378	00	V	200	30/ 31	22	0	100	-18.7	-2.1	21.6	4
62378	12	V	200	30/ 31	23	0	100	-18.3	-3.1	23.3	4
67197	12	V	150	-25/ 47	10	0	10	5.1	0.5	16.5	1
68174	12	V	200	-24/ 29	11	0	100	-12.2	-5.8	19.8	3
68442	12	V	200	-29/ 26	15	0	100	-18.4	-4.9	23.0	2
68512	12	V	200	-30/ 18	21	0	100	-12.1	-0.9	16.7	2
68842	12	V	200	-34/ 26	12	0	100	-12.6	-0.3	16.6	1
83612	12	V	250	-20/ -55	26	0	100	-2.4	-2.8	16.0	1
85586	12	V	150	-34/ -72	25	0	4	-5.1	1.6	22.5	1
98223	00	V	200	18/ 121	15	0	100	10.6	-1.9	15.8	2

Figure 9. TEMP/PILOT 300 hPa wind mean daily count. APRIL 2002
All hours
Global average number of observations in 24 hours = 1321

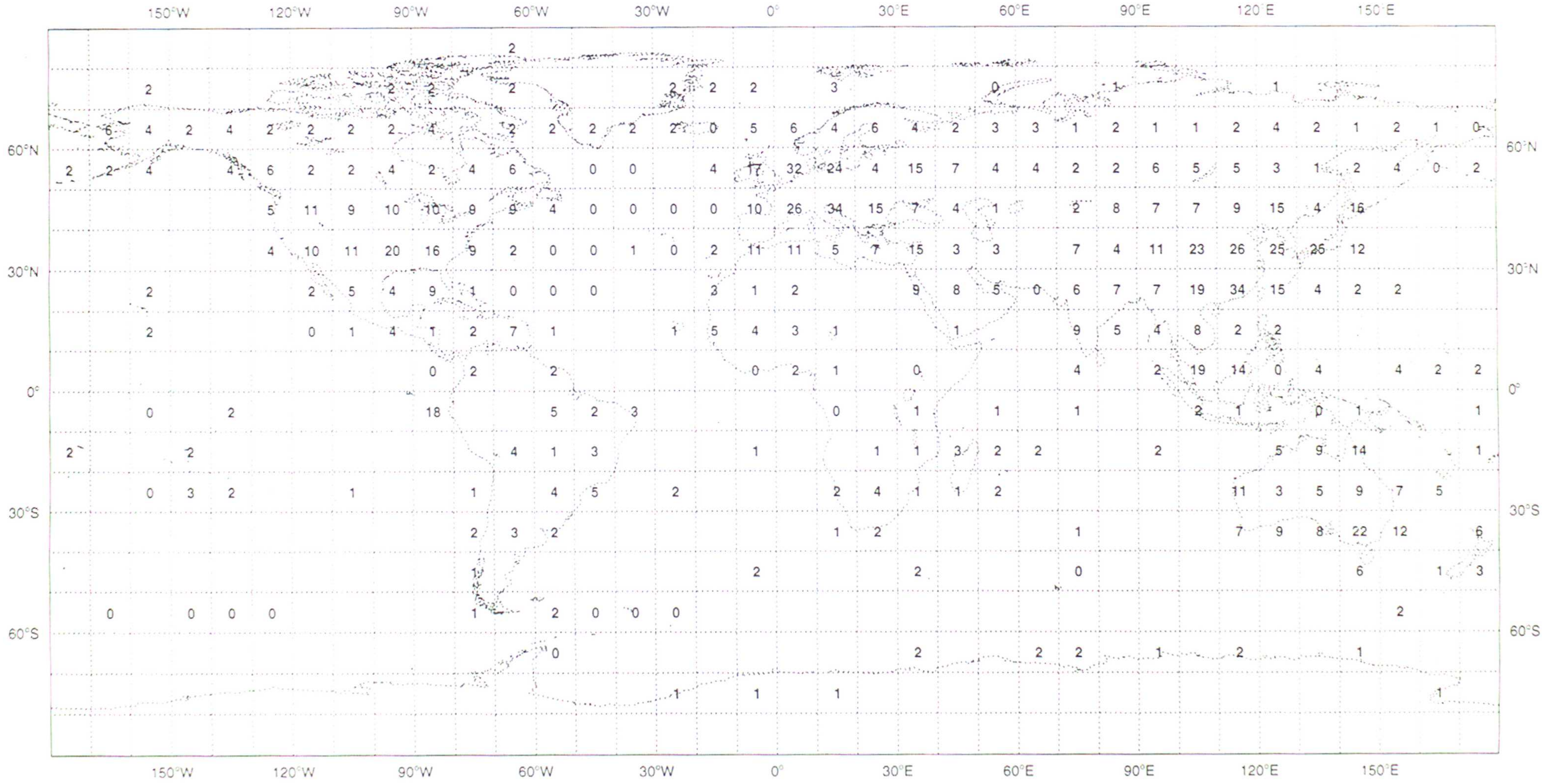

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
2
2 2 2 2 2 2 2 3 0 1 1
6 4 2 4 2 2 2 2 4 2 2 2 2 2 0 5 6 4 6 4 2 3 3 1 2 1 1 2 4 2 1 2 1 0
2 2 4 4 6 2 2 4 2 4 6 0 0 4 17 32 24 4 15 7 4 4 2 2 6 5 5 3 1 2 4 0 2
5 11 9 10 10 8 9 4 0 0 0 0 10 26 34 15 7 4 1 2 8 7 7 9 15 4 16
4 10 11 20 16 9 2 0 0 1 0 2 11 11 5 7 15 3 3 7 4 11 23 26 25 26 12
2 2 5 4 9 1 0 0 0 3 1 2 9 8 5 0 6 7 7 19 34 15 4 2 2
2 0 1 4 1 2 7 1 1 5 4 3 1 1 9 5 4 8 2 2
0 2 2 0 2 1 0 4 2 19 14 0 4 4 2 2
0 2 18 5 2 3 0 1 1 1 2 1 0 1 1
2 2 4 1 3 1 1 1 3 2 2 2 5 9 14 1 1
0 3 2 1 1 4 5 2 2 4 1 1 2 11 3 5 9 7 5
2 3 2 1 2 1 7 9 8 22 12 6
1 2 2 0 6 1 3
0 0 0 0 1 2 0 0 0 2
0 2 2 2 1 2 1
1 1 1 1

TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: April 2002

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 500.0 - 150.0 hPa
Element monitored		:WIND DIRECTION in degrees
Parameters monitored		
	:NUM OBS	:Average number of observations at all levels.
	:BIAS	:Mean difference of observations from background values from all levels.
	:MAX SPREAD	:(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels
	:SD	:SD of difference of observations from background values at all levels.

SELECTION CRITERIA :NUM OBS ≥ 5, and
ABSOLUTE BIAS ≥ 10°, with
SD < 30°, and
MAX SPREAD < 10°

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
29612	12	DD	55/ 78	18	21.6	3.9	8.7
38341	00	DD	43/ 71	15	36.3	4.4	15.9
42397	12	DD	27/ 88	8	12.9	8.4	11.7
59758	12	DD	20/ 110	24	10.1	5.8	13.3
62337	00	DD	31/ 34	26	-18.1	2.8	7.4
62337	12	DD	31/ 34	27	-18.9	2.6	5.9

MONITORING OF SATELLITE WINDS

MONITORING CENTRE: BRACKNELL

MONTH: April 2002

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from GOES-8, GOES-10, METEOSAT-5, METEOSAT-7, GMS-5, INSAT.

Standard of comparison :Background field from UKMO global model.

Selection Criteria :number of observations > 10.

Data Extracted :Layer 701 - 1000 hPa
401 - 700 hPa
101 - 400 hPa

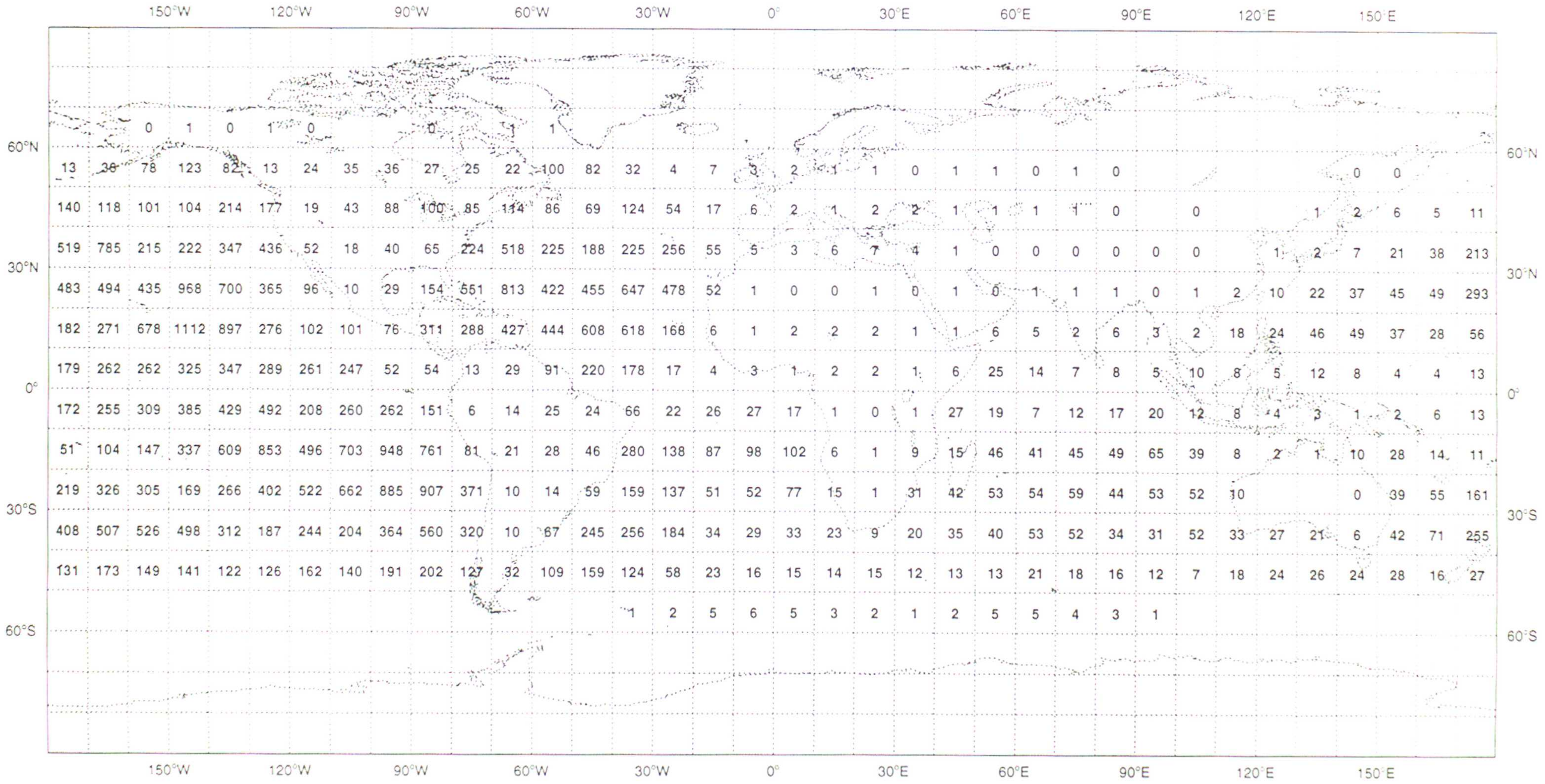
:Mean wind

:Mean observation minus background vector wind differences

:Mean observation minus background speed differences

:RMS of observation minus background vector differences

Figure 10. SATOB 701 - 1000 hPa mean daily count. APRIL 2002
Global average number of observations in 24 hours = 48773



		0	1	0	1	0			0		1	1																							
13	36	78	123	82	13	24	35	36	27	25	22	100	82	32	4	7	3	2	1	1	0	1	1	0	1	0						0	0		
140	118	101	104	214	177	19	43	88	100	85	114	86	69	124	54	17	6	2	1	2	2	1	1	1	1	0		0			1	2	6	5	11
519	785	215	222	347	436	52	18	40	65	224	518	225	188	225	256	55	5	3	6	7	4	1	0	0	0	0	0	0		1	2	7	21	38	213
483	494	435	968	700	365	96	10	29	154	551	813	422	455	647	478	52	1	0	0	1	0	1	0	1	1	1	0	1	2	10	22	37	45	49	293
182	271	678	1112	897	276	102	101	76	311	288	427	444	608	618	168	6	1	2	2	2	1	1	6	5	2	6	3	2	18	24	46	49	37	28	56
179	262	262	325	347	289	261	247	52	54	13	29	91	220	178	17	4	3	1	2	2	1	6	25	14	7	8	5	10	8	5	12	8	4	4	13
172	255	309	385	429	492	208	260	262	151	6	14	25	24	66	22	26	27	17	1	0	1	27	19	7	12	17	20	12	8	4	3	1	2	6	13
51	104	147	337	609	853	496	703	948	761	81	21	28	46	280	138	87	98	102	6	1	9	15	46	41	45	49	65	39	8	2	1	10	28	14	11
219	326	305	169	266	402	522	662	885	907	371	10	14	59	159	137	51	52	77	15	1	31	42	53	54	59	44	53	52	10			0	39	55	161
408	507	526	498	312	187	244	204	364	560	320	10	67	245	256	184	34	29	33	23	9	20	35	40	53	52	34	31	52	33	27	21	6	42	71	255
131	173	149	141	122	126	162	140	191	202	127	32	109	159	124	58	23	16	15	14	15	12	13	13	21	18	16	12	7	18	24	26	24	28	16	27
														1	2	5	6	5	3	2	1	2	5	5	4	3	1								

Figure 11. SATOB 701 - 1000 hPa vector mean wind. APRIL 2002

All observations

Arrows are plotted where greater than 10 obs are present

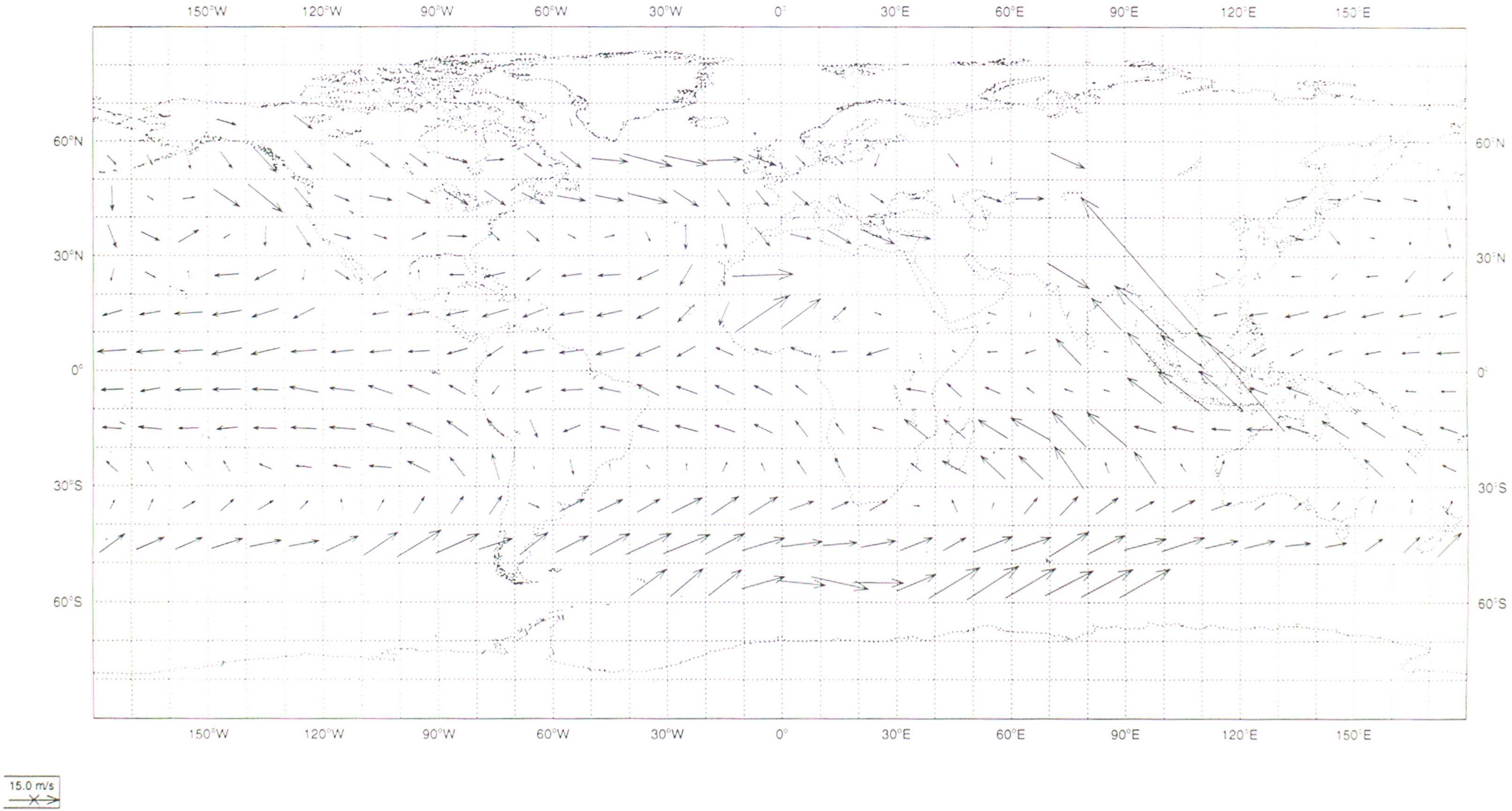

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0 m/s

Figure 12. SATOB 701 - 1000 hPa vector wind differences. APRIL 2002
All observations
Arrows are plotted where greater than 10 obs are present

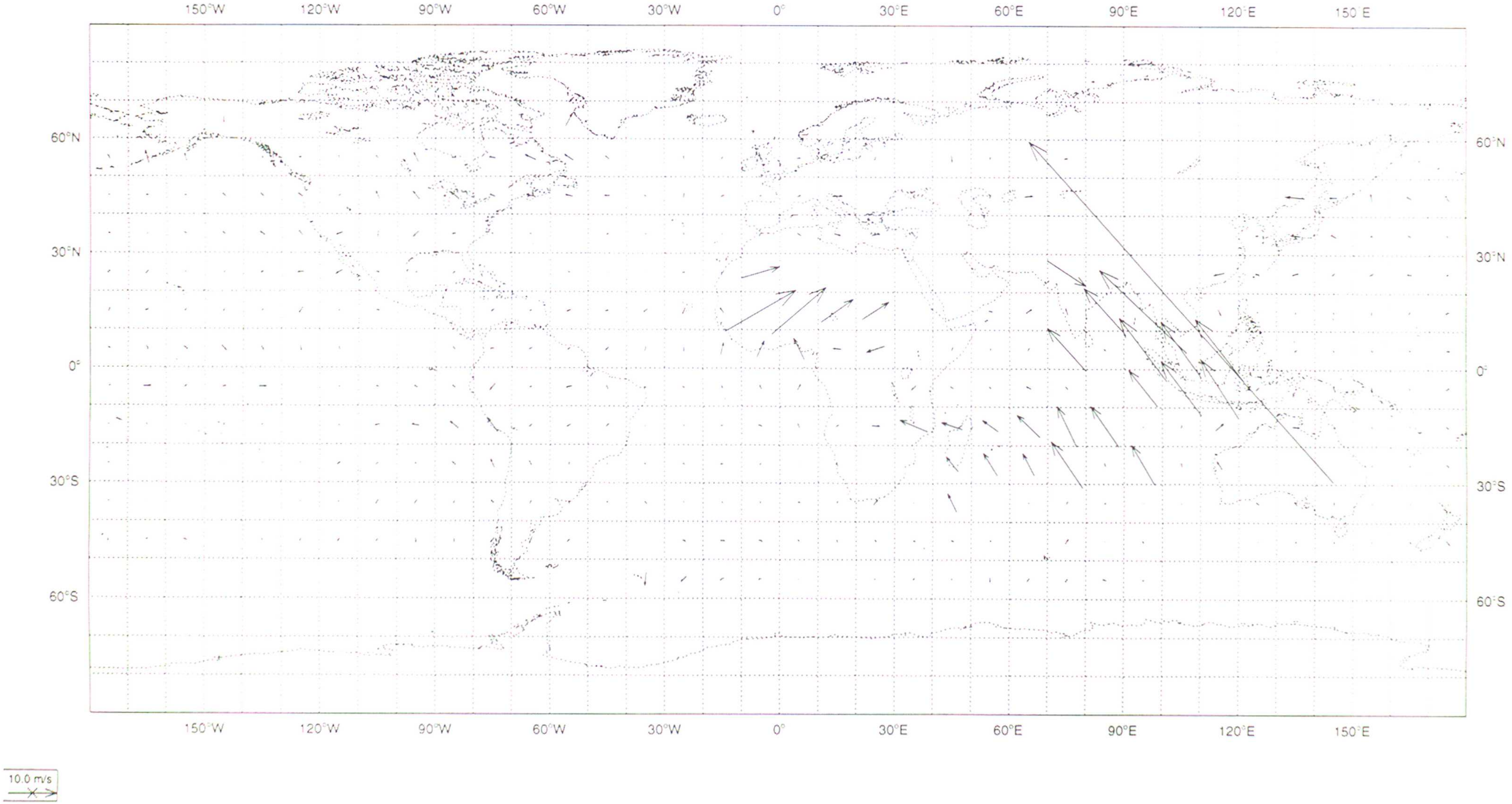

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0 m/s

Figure 13. SATOB 701 - 1000 hPa mean O-B speed differences (ms-1). APRIL 2002
All observations
Values are plotted where greater than 10 obs are present

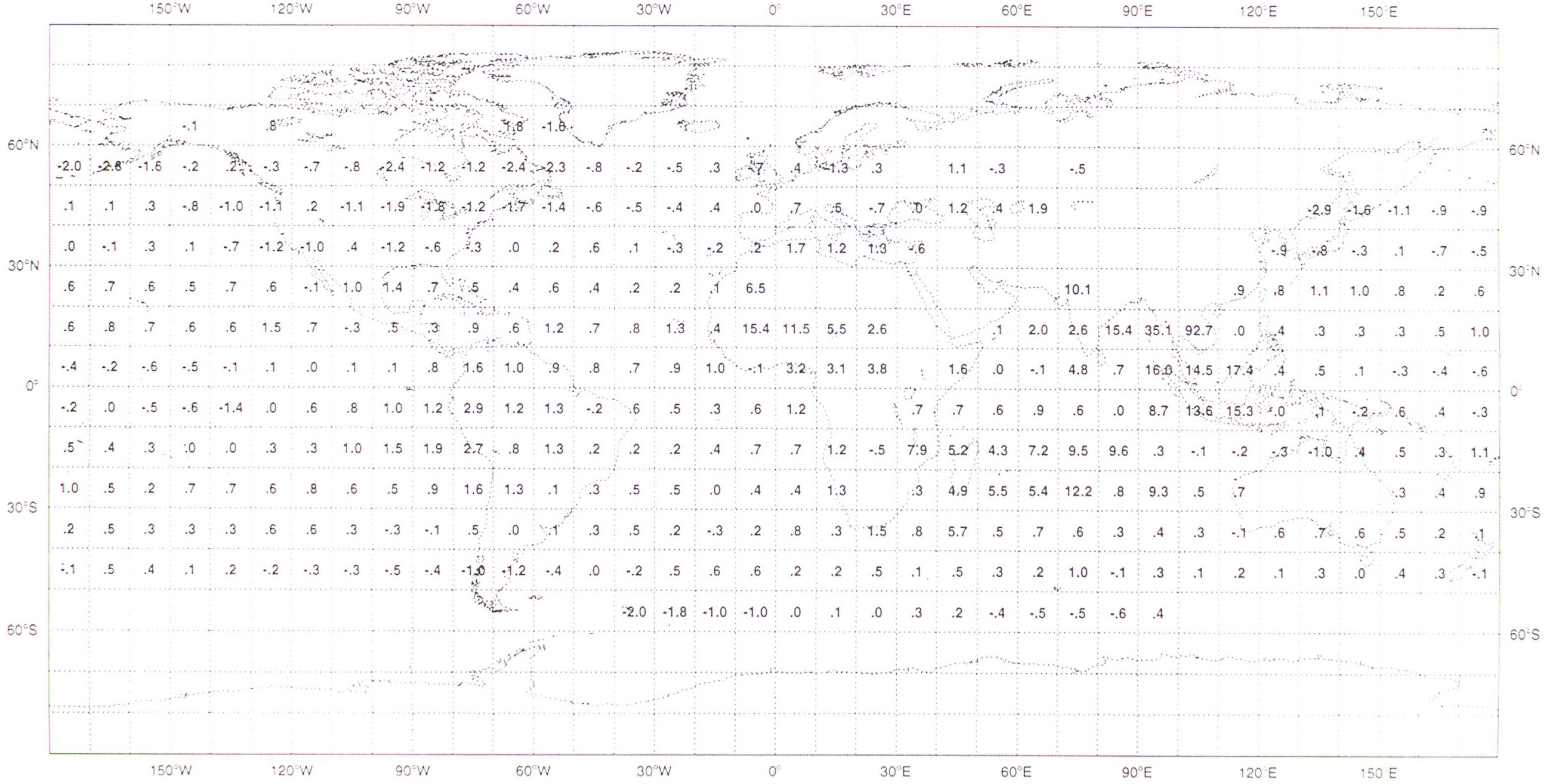

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
-.1 .8 1.8 -1.6
-2.0 -2.8 -1.6 -.2 .2 -.3 -.7 -.8 -2.4 -1.2 -1.2 -2.4 -2.3 -.8 -.2 -.5 .3 -.7 .4 -1.3 .3 1.1 -.3 -.5
.1 .1 .3 -.8 -1.0 -1.1 .2 -1.1 -1.9 -1.8 -1.2 -1.7 -1.4 -.6 -.5 -.4 .4 .0 .7 .5 -.7 .0 1.2 .4 1.9 -2.9 -1.6 -1.1 -.9 -.9
.0 -.1 .3 .1 -.7 -1.2 -1.0 .4 -1.2 -.6 -.3 .0 .2 .6 .1 -.3 -.2 .2 1.7 1.2 1.3 -.6 -.9 -.8 -.3 .1 -.7 -.5
.6 .7 .6 .5 .7 .6 -.1 1.0 1.4 .7 .5 .4 .6 .4 .2 .2 .1 6.5 10.1 .9 .8 1.1 1.0 .8 .2 .6
.6 .8 .7 .6 .6 1.5 .7 -.3 .5 .3 .9 .6 1.2 .7 .8 1.3 .4 15.4 11.5 5.5 2.6 .1 2.0 2.6 15.4 35.1 92.7 .0 .4 .3 .3 .3 .5 1.0
-.4 -.2 -.6 -.5 -.1 .1 .0 .1 .1 .8 1.6 1.0 .9 .8 .7 .9 1.0 -.1 3.2 3.1 3.8 1.6 .0 -.1 4.8 .7 16.0 14.5 17.4 .4 .5 .1 -.3 -.4 -.6
-.2 .0 -.5 -.6 -1.4 .0 .6 .8 1.0 1.2 2.9 1.2 1.3 -.2 .6 .5 .3 .6 1.2 .7 .7 .6 .9 .6 .0 8.7 13.6 15.3 .0 .1 -.2 .6 .4 -.3
.5 .4 .3 .0 .0 .3 .3 1.0 1.5 1.9 2.7 .8 1.3 .2 .2 .2 .4 .7 .7 1.2 -.5 7.9 5.2 4.3 7.2 9.5 9.6 .3 -.1 -.2 -.3 -1.0 .4 .5 .3 1.1
1.0 .5 .2 .7 .7 .6 .8 .6 .5 .9 1.6 1.3 .1 .3 .5 .5 .0 .4 .4 1.3 .3 4.9 5.5 5.4 12.2 .8 9.3 .5 .7 .3 .4 .9
.2 .5 .3 .3 .3 .6 .6 .3 -.3 -.1 .5 .0 .1 .3 .5 .2 -.3 .2 .8 .3 1.5 .8 5.7 .5 .7 .6 .3 .4 .3 -.1 .6 .7 .6 .5 .2 .1
-.1 .5 .4 .1 .2 -.2 -.3 -.3 -.5 -.4 -1.0 -1.2 -.4 .0 -.2 .5 .6 .6 .2 .2 .5 .1 .5 .3 .2 1.0 -.1 .3 .1 .2 .1 .3 .0 .4 .3 -.1
-2.0 -1.8 -1.0 -1.0 .0 .1 .0 .3 .2 -.4 -.5 -.5 -.6 .4

Figure 14. SATOB 701 - 1000 hPa RMS O-B vector differences (ms-1). APRIL 2002

All observations

Values are plotted where greater than 10 obs are present

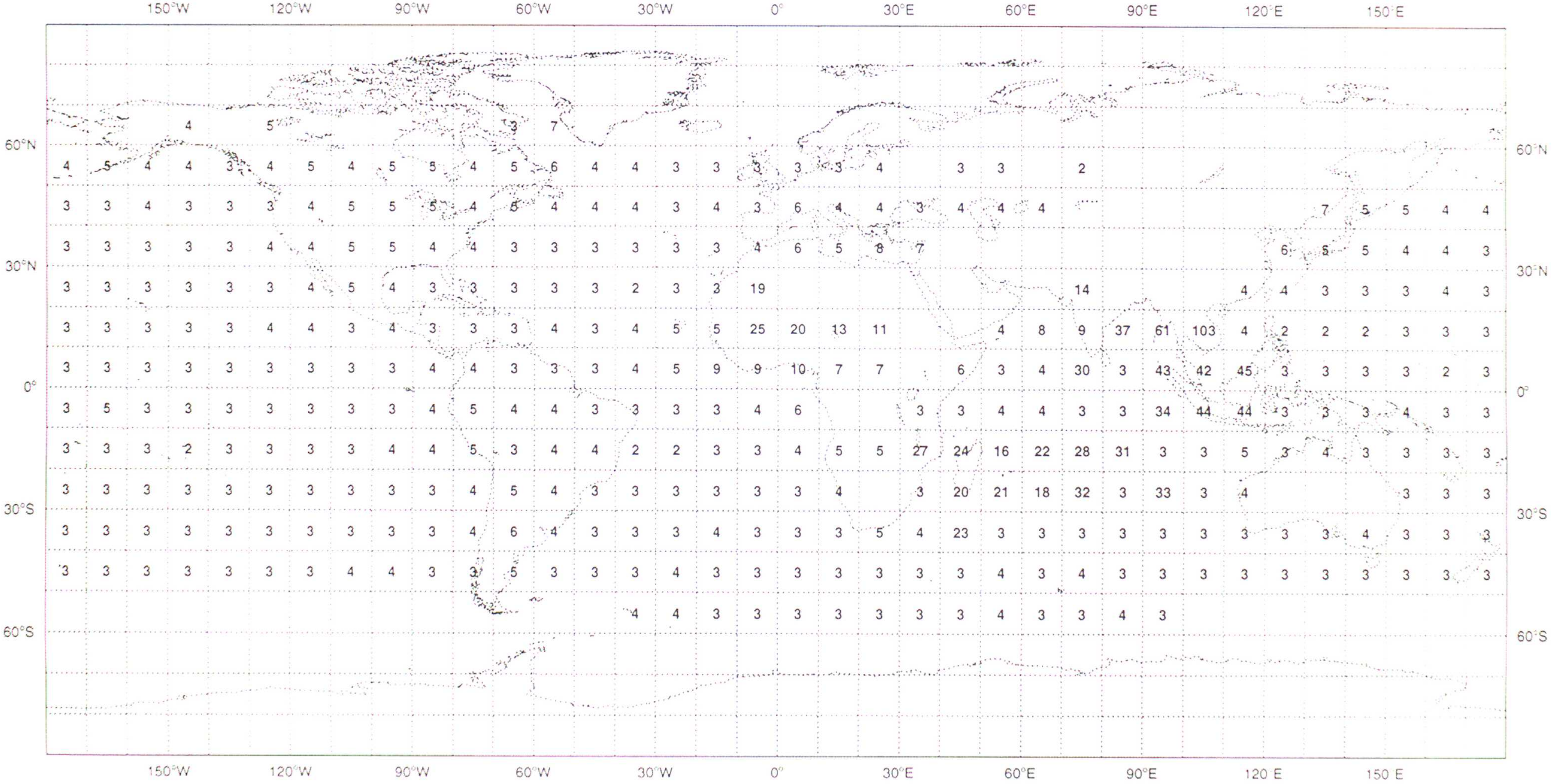

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
4 5 3 7
4 5 4 4 3 4 5 4 5 5 4 5 6 4 4 3 3 3 3 3 4 3 3 2
3 3 4 3 3 3 4 5 5 5 4 5 4 4 4 3 4 3 6 4 4 3 4 4 4 7 5 5 4 4
3 3 3 3 3 4 4 5 5 4 4 3 3 3 3 3 3 4 6 5 8 7 6 5 5 4 4 3
3 3 3 3 3 3 4 5 4 3 3 3 3 3 2 3 3 19 14 4 4 3 3 3 4 3
3 3 3 3 3 4 4 3 4 3 3 3 4 3 4 5 5 25 20 13 11 4 8 9 37 61 103 4 2 2 2 3 3 3
3 3 3 3 3 3 3 3 3 4 4 3 3 3 4 5 9 9 10 7 7 6 3 4 30 3 43 42 45 3 3 3 3 2 3
3 5 3 3 3 3 3 3 3 4 5 4 4 3 3 3 3 4 6 3 3 4 4 3 3 34 44 44 3 3 3 4 3 3
3 3 3 2 3 3 3 3 4 4 5 3 4 4 2 2 3 3 4 5 5 27 24 16 22 28 31 3 3 5 3 4 3 3 3 3
3 3 3 3 3 3 3 3 3 3 4 5 4 3 3 3 3 3 3 4 3 20 21 18 32 3 33 3 4 3 3 3
3 3 3 3 3 3 3 3 3 3 4 6 4 3 3 3 4 3 3 3 5 4 23 3 3 3 3 3 3 3 3 3 4 3 3 3
3 3 3 3 3 3 3 4 4 3 3 5 3 3 3 4 3 3 3 3 3 3 3 4 3 4 3 3 3 3 3 3 3 3 3 3
4 4 3 3 3 3 3 3 3 4 3 3 4 3
150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120 E 150 E
60°N 30°N 0° 30°S 60°S

Figure 15. SATOB 401 - 700 hPa mean daily count. APRIL 2002
Global average number of observations in 24 hours = 13290

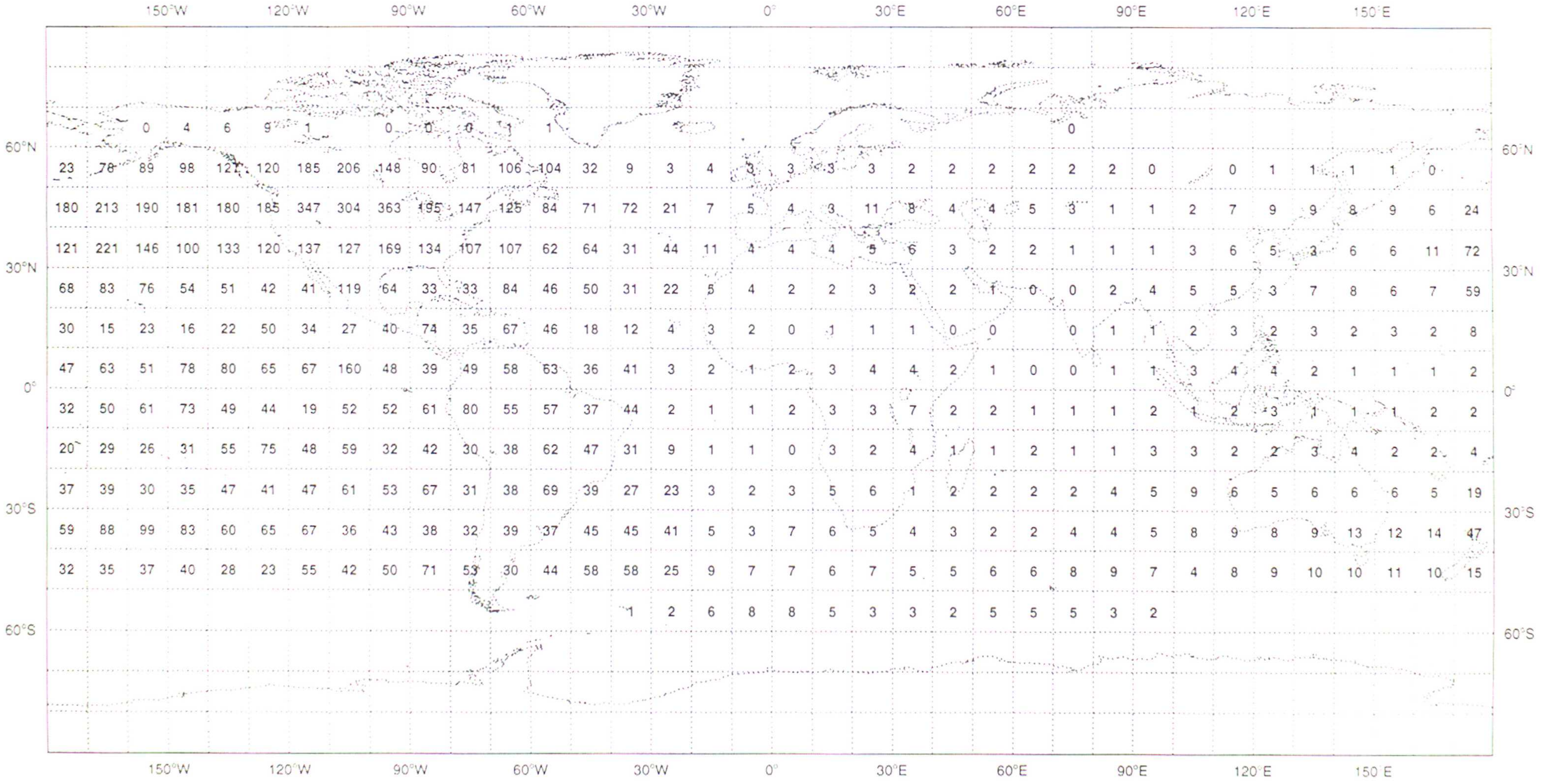

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0 4 6 9 1 0 0 0 1 1 0
23 78 89 98 121 120 185 206 148 90 81 106 104 32 9 3 4 3 3 3 3 2 2 2 2 2 2 0 0 1 1 1 1 0
180 213 190 181 180 185 347 304 363 195 147 125 84 71 72 21 7 5 4 3 11 8 4 4 5 3 1 1 2 7 9 9 8 9 6 24
121 221 146 100 133 120 137 127 169 134 107 107 62 64 31 44 11 4 4 4 5 6 3 2 2 1 1 1 3 6 5 3 6 6 11 72
68 83 76 54 51 42 41 119 64 33 33 84 46 50 31 22 5 4 2 2 3 2 2 1 0 0 2 4 5 5 3 7 8 6 7 59
30 15 23 16 22 50 34 27 40 74 35 67 46 18 12 4 3 2 0 1 1 1 0 0 0 1 1 2 3 2 3 2 3 2 8
47 63 51 78 80 65 67 160 48 39 49 58 63 36 41 3 2 1 2 3 4 4 2 1 0 0 1 1 3 4 4 2 1 1 1 2
32 50 61 73 49 44 19 52 52 61 80 55 57 37 44 2 1 1 2 3 3 7 2 2 1 1 1 2 1 2 3 1 1 1 2 2
20 29 26 31 55 75 48 59 32 42 30 38 62 47 31 9 1 1 0 3 2 4 1 1 2 1 1 3 3 2 2 3 4 2 2 4
37 39 30 35 47 41 47 61 53 67 31 38 69 39 27 23 3 2 3 5 6 1 2 2 2 2 4 5 9 6 5 6 6 6 5 19
59 88 99 83 60 65 67 36 43 38 32 39 37 45 45 41 5 3 7 6 5 4 3 2 2 4 4 5 8 9 8 9 13 12 14 47
32 35 37 40 28 23 55 42 50 71 53 30 44 58 58 25 9 7 7 6 7 5 5 6 6 8 9 7 4 8 9 10 10 11 10 15
1 2 6 8 8 5 3 3 2 5 5 5 3 2

Figure 16. SATOB 401 - 700 hPa vector mean wind. APRIL 2002
All observations
Arrows are plotted where greater than 10 obs are present

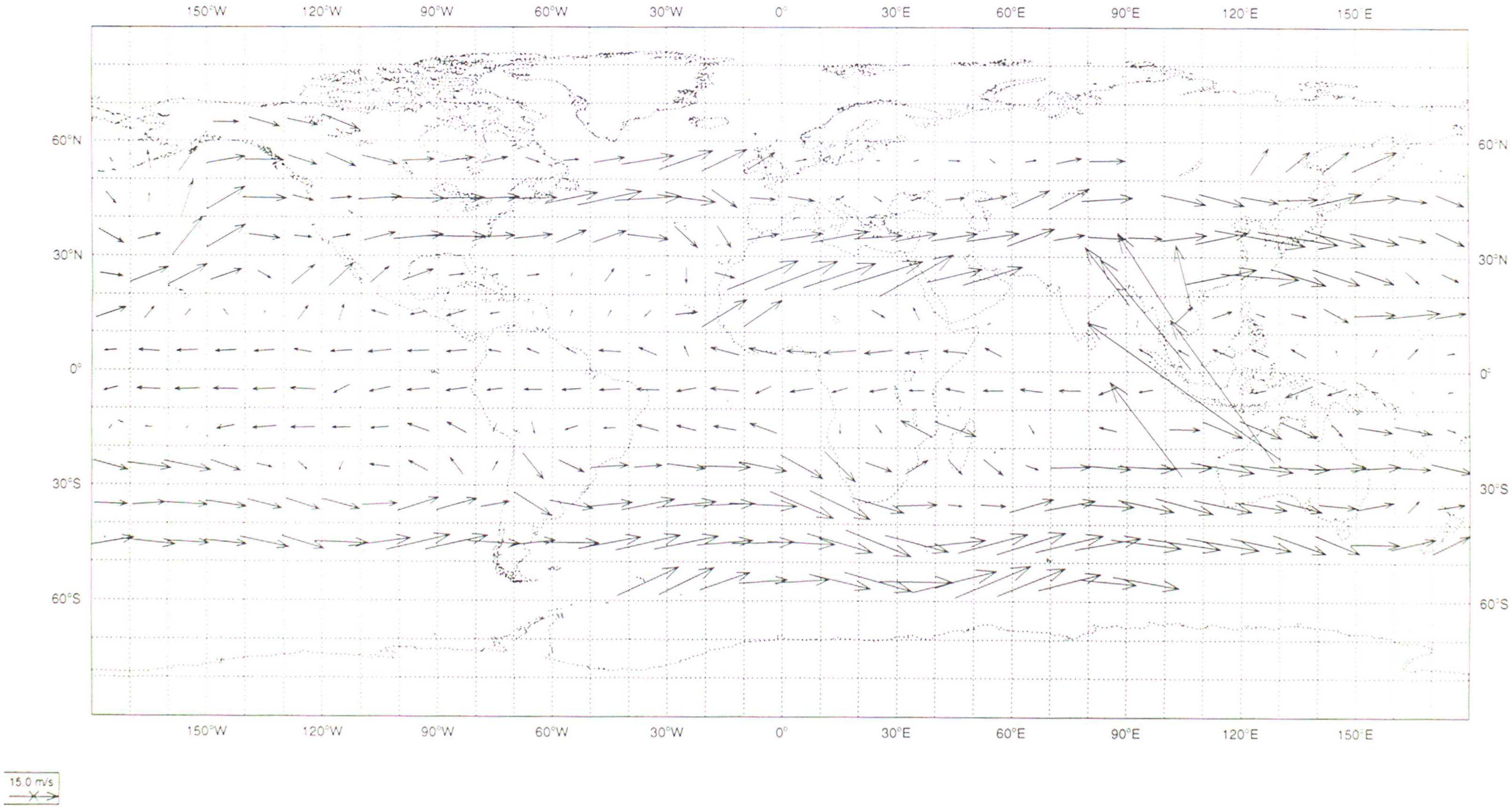

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0 m/s

Figure 17. SATOB 401 - 700 hPa vector wind differences. APRIL 2002

All observations

Arrows are plotted where greater than 10 obs are present

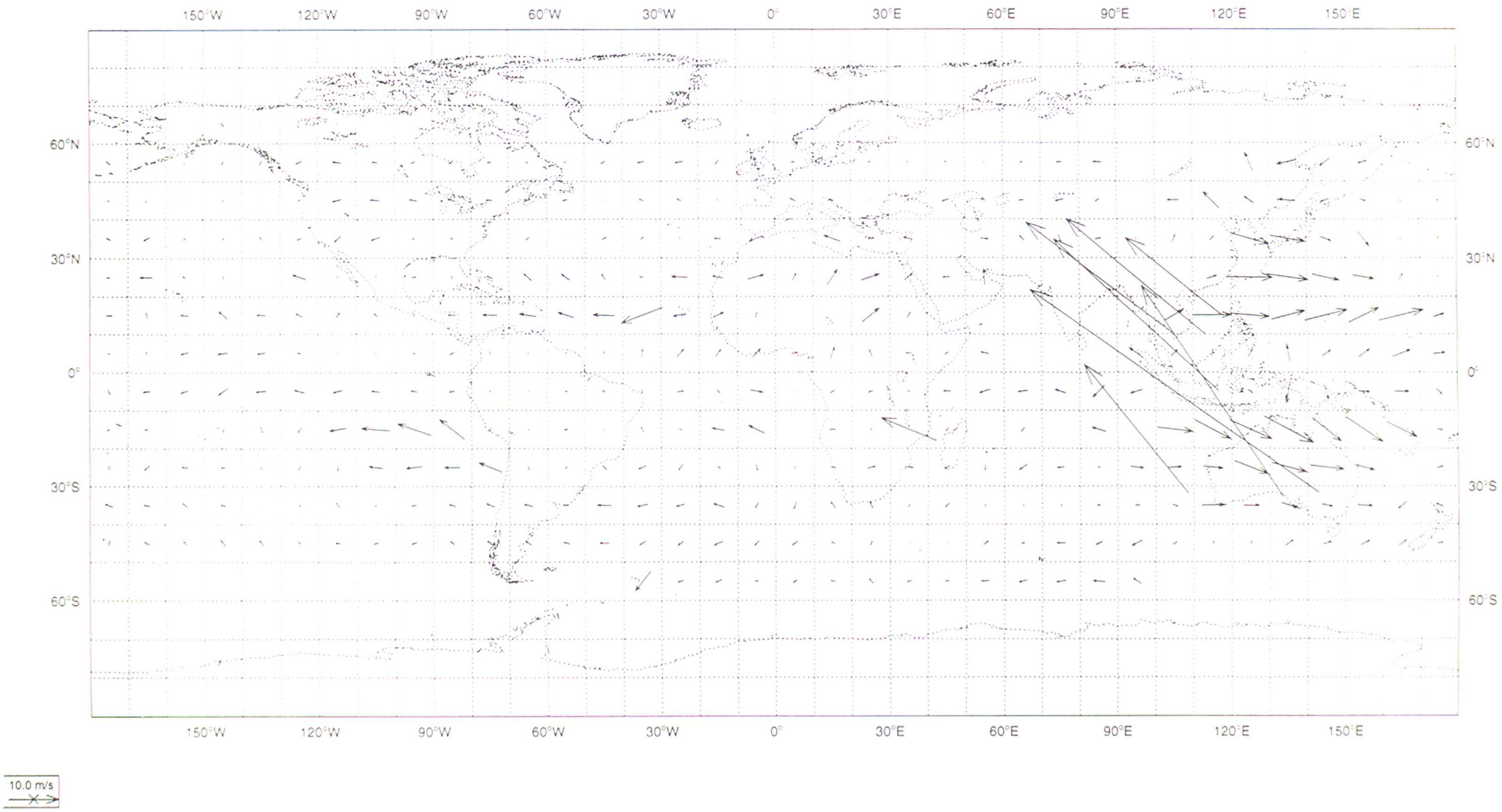

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0 m/s

Figure 18. SATOB 401 - 700 hPa mean O-B speed differences (ms-1). APRIL 2002
All observations
Values are plotted where greater than 10 obs are present

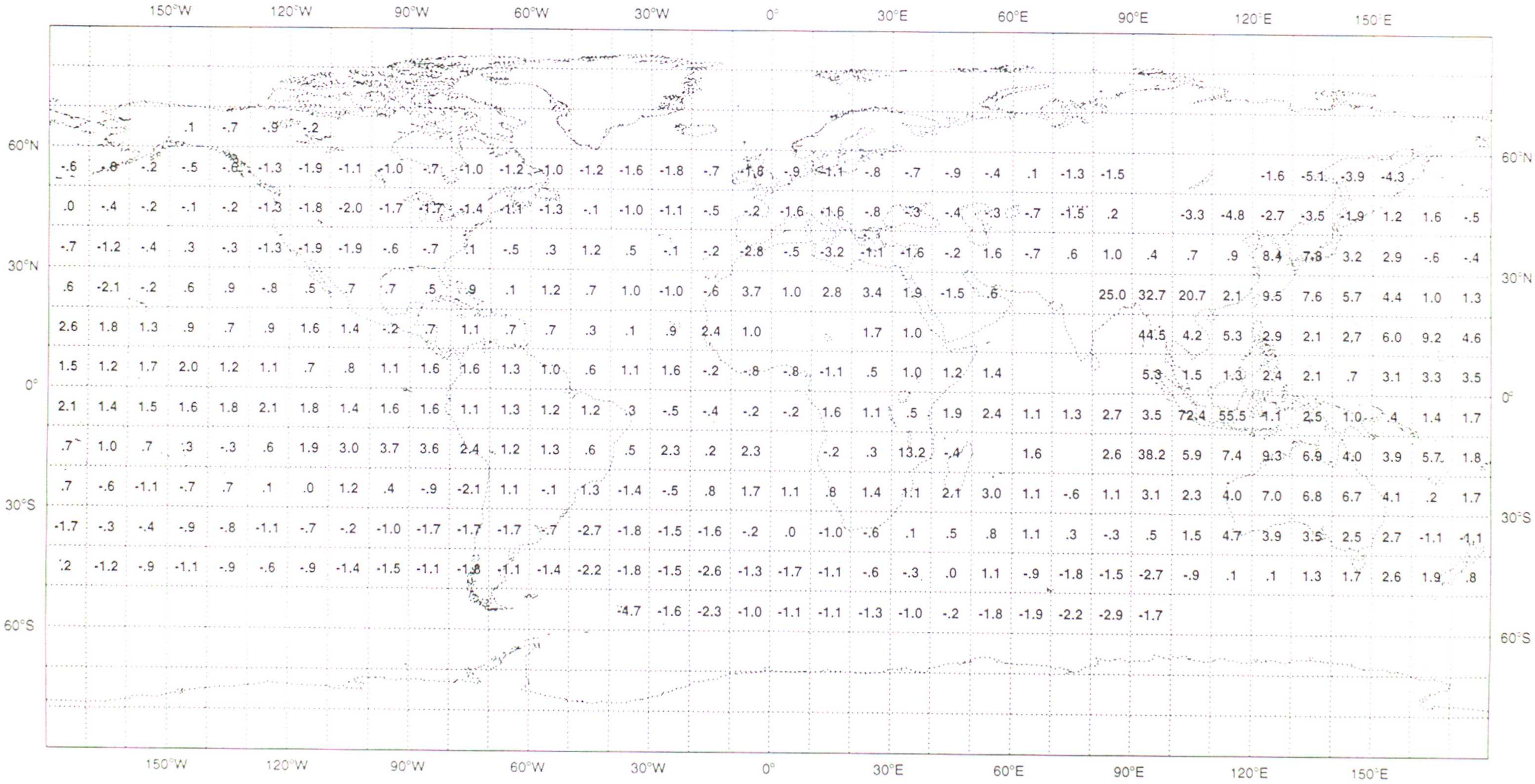
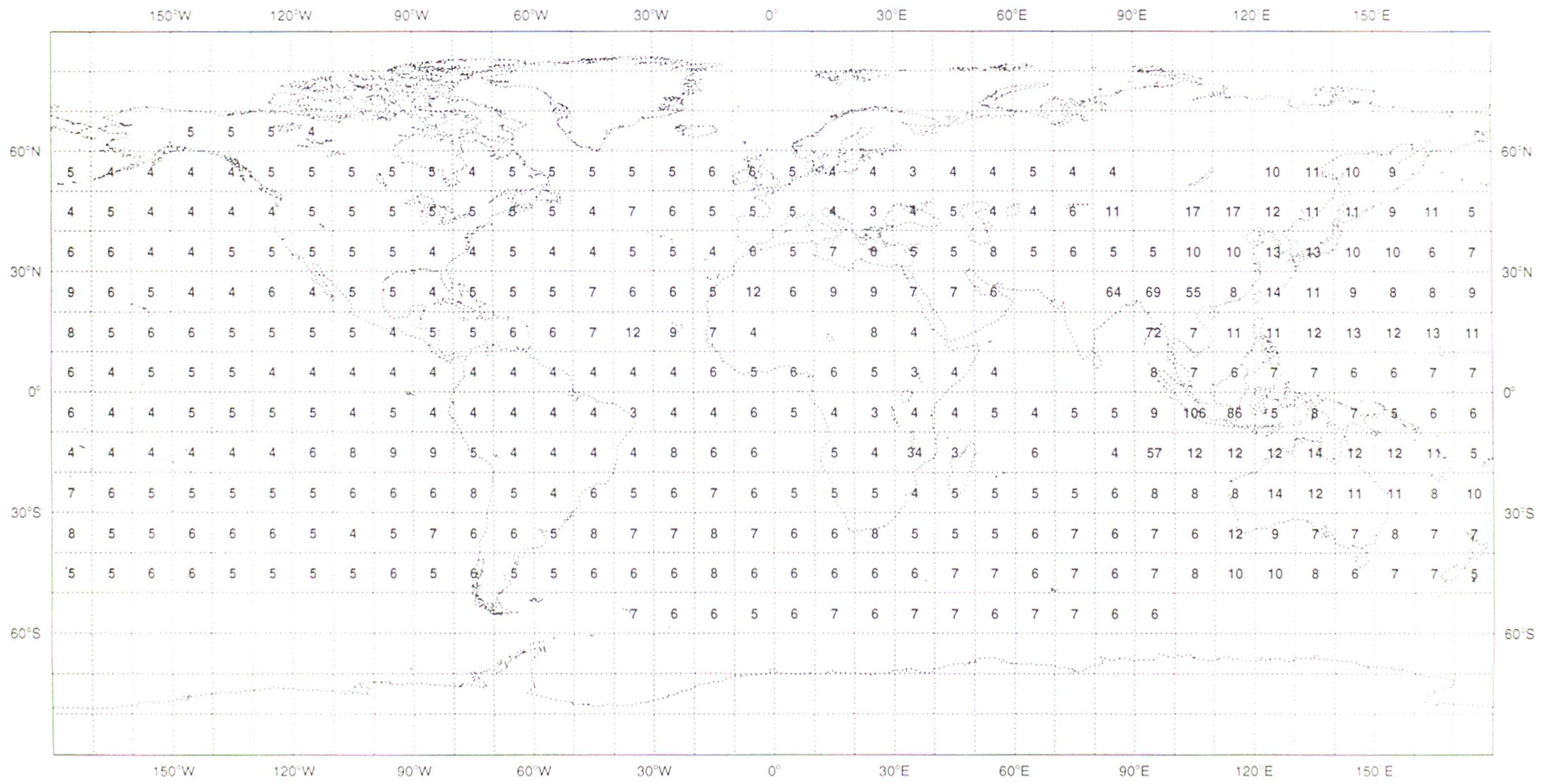

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
.1 -.7 -.9 -.2
-.6 .8 -.2 -.5 -.6 -1.3 -1.9 -1.1 -1.0 -.7 -1.0 -1.2 -1.0 -1.2 -1.6 -1.8 -.7 -1.8 -.9 -1.1 -.8 -.7 -.9 -.4 .1 -1.3 -1.5 -1.6 -5.1 -3.9 -4.3
.0 -.4 -.2 -.1 -.2 -1.3 -1.8 -2.0 -1.7 -1.7 -1.4 -1.1 -1.3 -.1 -1.0 -1.1 -.5 -.2 -1.6 -1.6 -.8 -.3 -.4 -.3 -.7 -1.5 .2 -3.3 -4.8 -2.7 -3.5 -1.9 1.2 1.6 -.5
-.7 -1.2 -.4 .3 -.3 -1.3 -1.9 -1.9 -.6 -.7 .1 -.5 .3 1.2 .5 -.1 -.2 -2.8 -.5 -3.2 -1.1 -1.6 -.2 1.6 -.7 .6 1.0 .4 .7 .9 8.4 7.8 3.2 2.9 -.6 -.4
.6 -2.1 -.2 .6 .9 -.8 .5 .7 .7 .5 .9 .1 1.2 .7 1.0 -1.0 -.6 3.7 1.0 2.8 3.4 1.9 -1.5 .6 25.0 32.7 20.7 2.1 9.5 7.6 5.7 4.4 1.0 1.3
2.6 1.8 1.3 .9 .7 .9 1.6 1.4 -.2 .7 1.1 .7 .7 .3 .1 .9 2.4 1.0 1.7 1.0 44.5 4.2 5.3 2.9 2.1 2.7 6.0 9.2 4.6
1.5 1.2 1.7 2.0 1.2 1.1 .7 .8 1.1 1.6 1.6 1.3 1.0 .6 1.1 1.6 -.2 -.8 -.8 -1.1 .5 1.0 1.2 1.4 5.3 1.5 1.3 2.4 2.1 .7 3.1 3.3 3.5
2.1 1.4 1.5 1.6 1.8 2.1 1.8 1.4 1.6 1.6 1.1 1.3 1.2 1.2 .3 -.5 -.4 -.2 -.2 1.6 1.1 .5 1.9 2.4 1.1 1.3 2.7 3.5 72.4 55.5 1.1 2.5 1.0 .4 1.4 1.7
.7 1.0 .7 .3 -.3 .6 1.9 3.0 3.7 3.6 2.4 1.2 1.3 .6 .5 2.3 .2 2.3 -.2 .3 13.2 -.4 1.6 2.6 38.2 5.9 7.4 9.3 6.9 4.0 3.9 5.7 1.8
.7 -.6 -1.1 -.7 .7 .1 .0 1.2 .4 -.9 -2.1 1.1 -.1 1.3 -1.4 -.5 .8 1.7 1.1 .8 1.4 1.1 2.1 3.0 1.1 -.6 1.1 3.1 2.3 4.0 7.0 6.8 6.7 4.1 .2 1.7
-1.7 -.3 -.4 -.9 -.8 -1.1 -.7 -.2 -1.0 -1.7 -1.7 -1.7 -.7 -2.7 -1.8 -1.5 -1.6 -.2 .0 -1.0 -.6 .1 .5 .8 1.1 .3 -.3 .5 1.5 4.7 3.9 3.5 2.5 2.7 -1.1 -1.1
.2 -1.2 -.9 -1.1 -.9 -.6 -.9 -1.4 -1.5 -1.1 -1.8 -1.1 -1.4 -2.2 -1.8 -1.5 -2.6 -1.3 -1.7 -1.1 -.6 -.3 .0 1.1 -.9 -1.8 -1.5 -2.7 -.9 .1 .1 1.3 1.7 2.6 1.9 .8
-4.7 -1.6 -2.3 -1.0 -1.1 -1.1 -1.3 -1.0 -.2 -1.8 -1.9 -2.2 -2.9 -1.7

Figure 19. SATOB 401 - 700 hPa RMS O-B vector differences (ms-1). APRIL 2002
All observations
Values are plotted where greater than 10 obs are present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60°N 30°N 0° 30°S 60°S
5 5 5 4
5 4 4 4 4 5 5 5 5 5 4 5 5 5 5 5 6 6 5 4 4 3 4 4 5 4 4 10 11 10 9
4 5 4 4 4 4 5 5 5 5 5 5 5 4 7 6 5 5 5 4 3 4 5 4 4 6 11 17 17 12 11 11 9 11 5
6 6 4 4 5 5 5 5 5 4 4 5 4 4 5 5 4 6 5 7 6 5 5 8 5 6 5 5 10 10 13 13 10 10 6 7
9 6 5 4 4 6 4 5 5 4 5 5 5 7 6 6 5 12 6 9 9 7 7 6 64 69 55 8 14 11 9 8 8 9
8 5 6 6 5 5 5 5 4 5 5 6 6 7 12 9 7 4 8 4 72 7 11 11 12 13 12 13 11
6 4 5 5 5 4 4 4 4 4 4 4 4 4 4 4 6 5 6 6 5 3 4 4 8 7 6 7 7 6 6 7 7
6 4 4 5 5 5 5 4 5 4 4 4 4 4 3 4 4 6 5 4 3 4 4 5 4 5 5 9 106 86 5 8 7 5 6 6
4 4 4 4 4 4 6 8 9 9 5 4 4 4 4 8 6 6 5 4 34 3 6 4 57 12 12 12 14 12 12 11 5
7 6 5 5 5 5 5 6 6 6 8 5 4 6 5 6 7 6 5 5 5 4 5 5 5 5 6 8 8 8 14 12 11 11 8 10
8 5 5 6 6 6 5 4 5 7 6 6 5 8 7 7 8 7 6 6 8 5 5 5 6 7 6 7 6 12 9 7 7 8 7 7
5 5 6 6 5 5 5 5 6 5 6 5 5 6 6 6 8 6 6 6 6 6 7 7 6 7 6 7 8 10 10 8 6 7 7 5
7 6 6 5 6 7 6 7 7 6 7 7 6 6

Figure 20. SATOB 101 - 400 hPa mean daily count. APRIL 2002
Global average number of observations in 24 hours = 68680

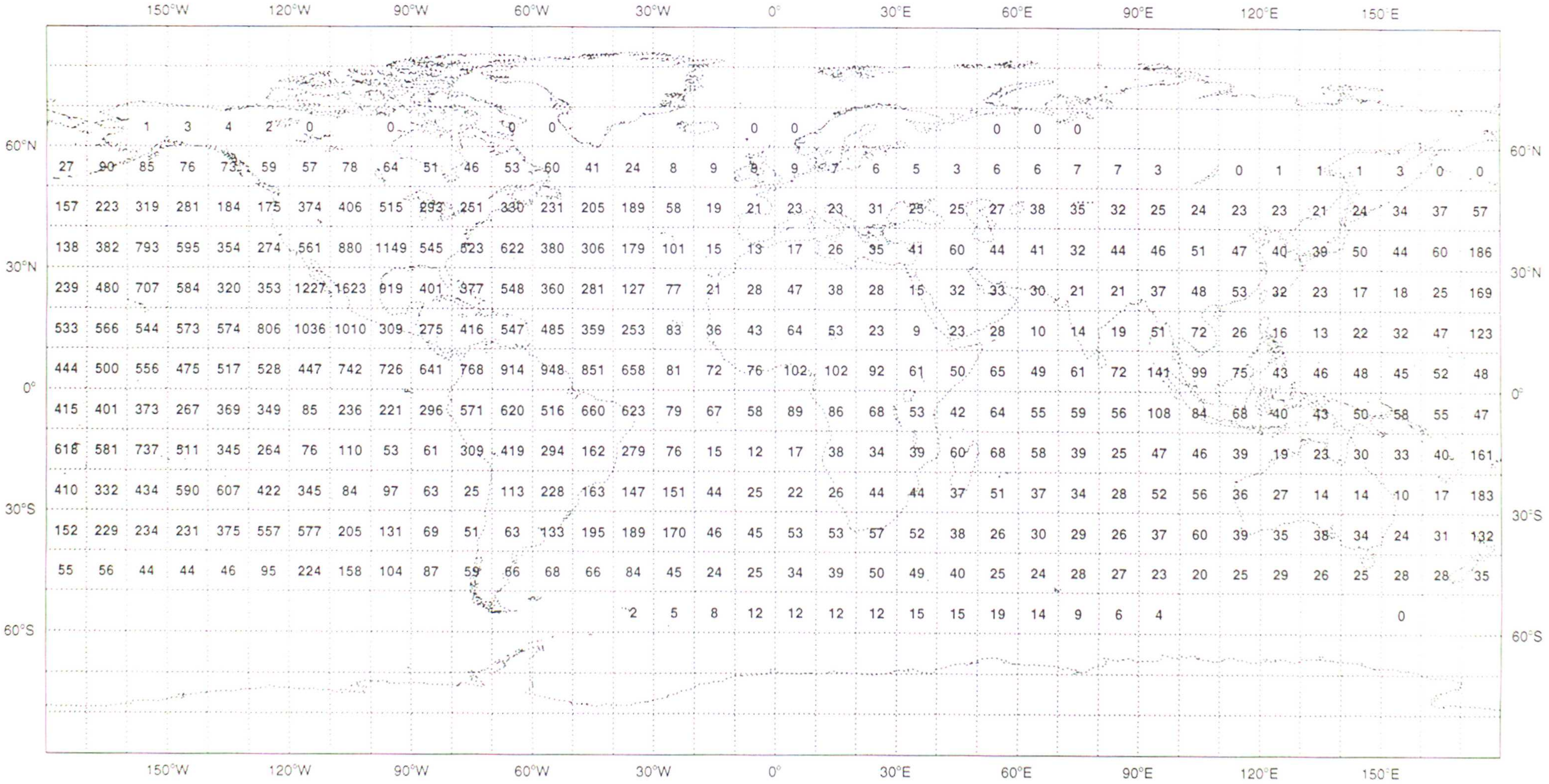

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
1 3 4 2 0 0 0 0 0 0 0 0 0
27 90 85 76 73 59 57 78 64 51 46 53 60 41 24 8 9 8 9 7 6 5 3 6 6 7 7 3 0 1 1 1 3 0 0
157 223 319 281 184 175 374 406 515 293 251 330 231 205 189 58 19 21 23 23 31 25 25 27 38 35 32 25 24 23 23 21 24 34 37 57
138 382 793 595 354 274 561 880 1149 545 623 622 380 306 179 101 15 13 17 26 35 41 60 44 41 32 44 46 51 47 40 39 50 44 60 186
239 480 707 584 320 353 1227 1623 919 401 377 548 360 281 127 77 21 28 47 38 28 15 32 33 30 21 21 37 48 53 32 23 17 18 25 169
533 566 544 573 574 806 1036 1010 309 275 416 547 485 359 253 83 36 43 64 53 23 9 23 28 10 14 19 51 72 26 16 13 22 32 47 123
444 500 556 475 517 528 447 742 726 641 768 914 948 851 658 81 72 76 102 102 92 61 50 65 49 61 72 141 99 75 43 46 48 45 52 48
415 401 373 267 369 349 85 236 221 296 571 620 516 660 623 79 67 58 89 86 68 53 42 64 55 59 56 108 84 68 40 43 50 58 55 47
618 581 737 511 345 264 76 110 53 61 309 419 294 162 279 76 15 12 17 38 34 39 60 68 58 39 25 47 46 39 19 23 30 33 40 161
410 332 434 590 607 422 345 84 97 63 25 113 228 163 147 151 44 25 22 26 44 44 37 51 37 34 28 52 56 36 27 14 14 10 17 183
152 229 234 231 375 557 577 205 131 69 51 63 133 195 189 170 46 45 53 53 57 52 38 26 30 29 26 37 60 39 35 38 34 24 31 132
55 56 44 44 46 95 224 158 104 87 59 66 68 66 84 45 24 25 34 39 50 49 40 25 24 28 27 23 20 25 29 26 25 28 28 35
2 5 8 12 12 12 12 15 15 19 14 9 6 4 0

Figure 21. SATOB 101 - 400 hPa vector mean wind. APRIL 2002
All observations
Arrows are plotted where greater than 10 obs are present

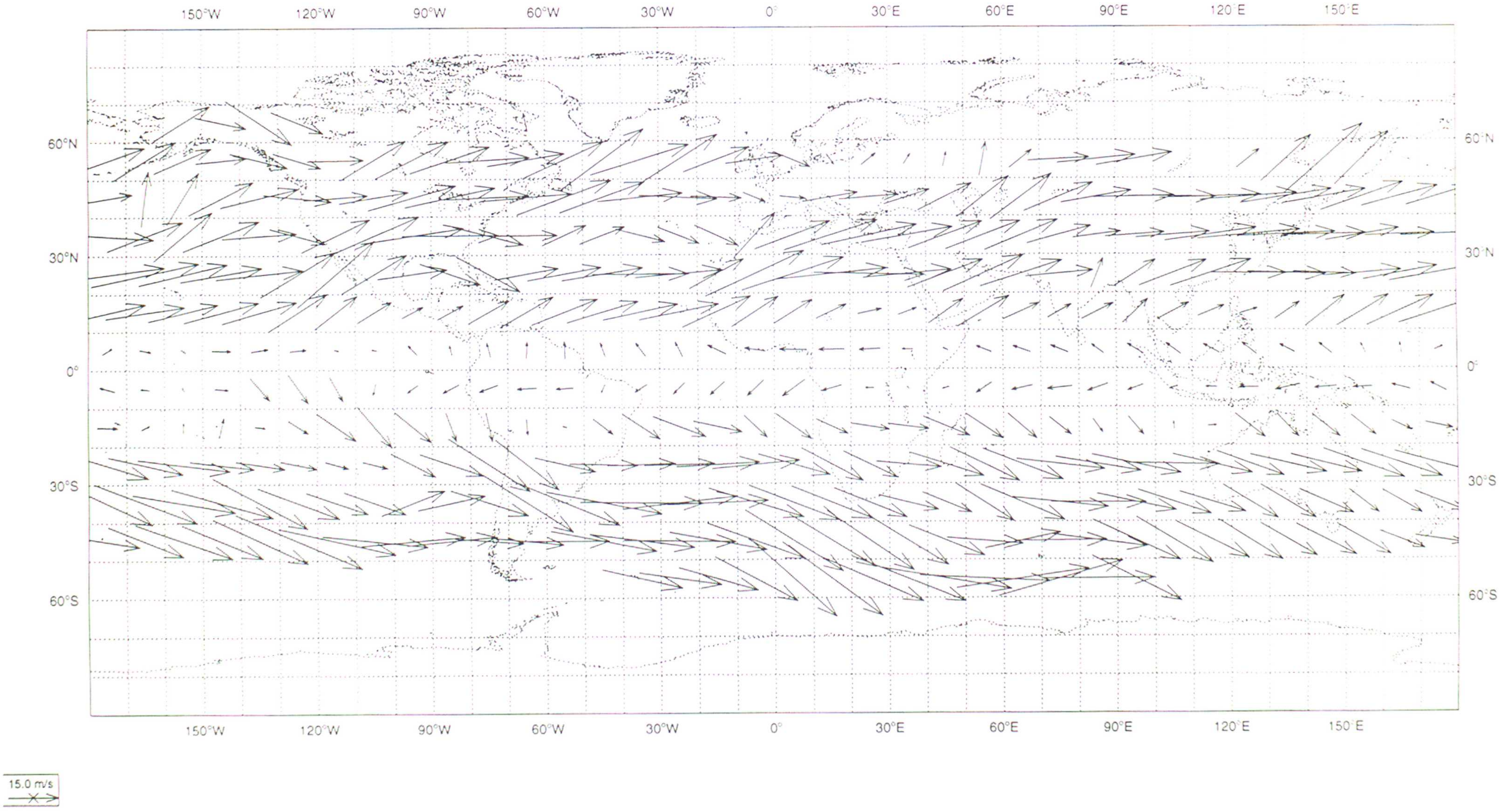

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0 m/s

Figure 22. SATOB 101 - 400 hPa vector wind differences. APRIL 2002
All observations
Arrows are plotted where greater than 10 obs are present

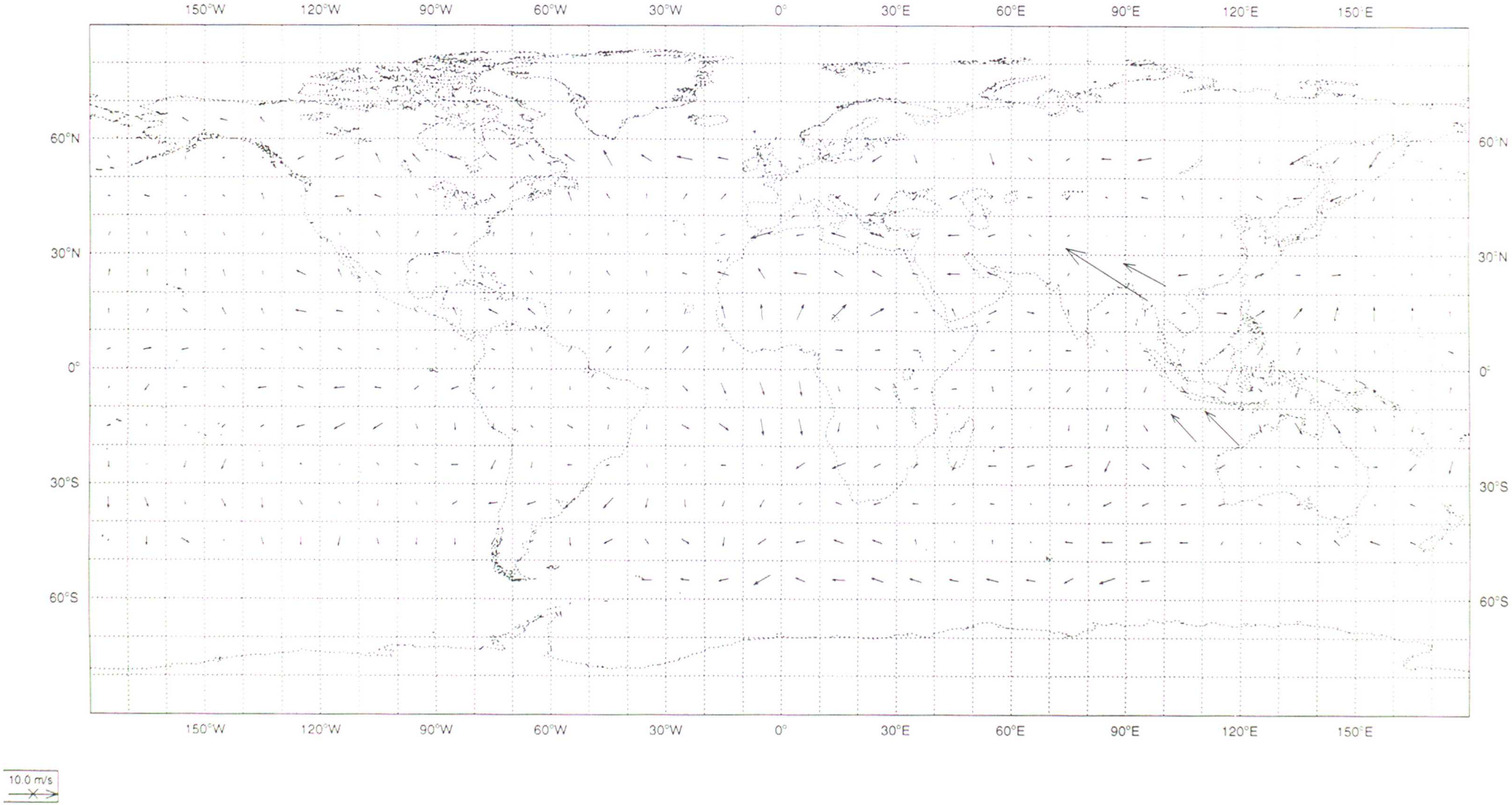

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0 m/s

Figure 23. SATOB 101 - 400 hPa mean O-B speed differences (ms-1). APRIL 2002
All observations
Values are plotted where greater than 10 obs are present

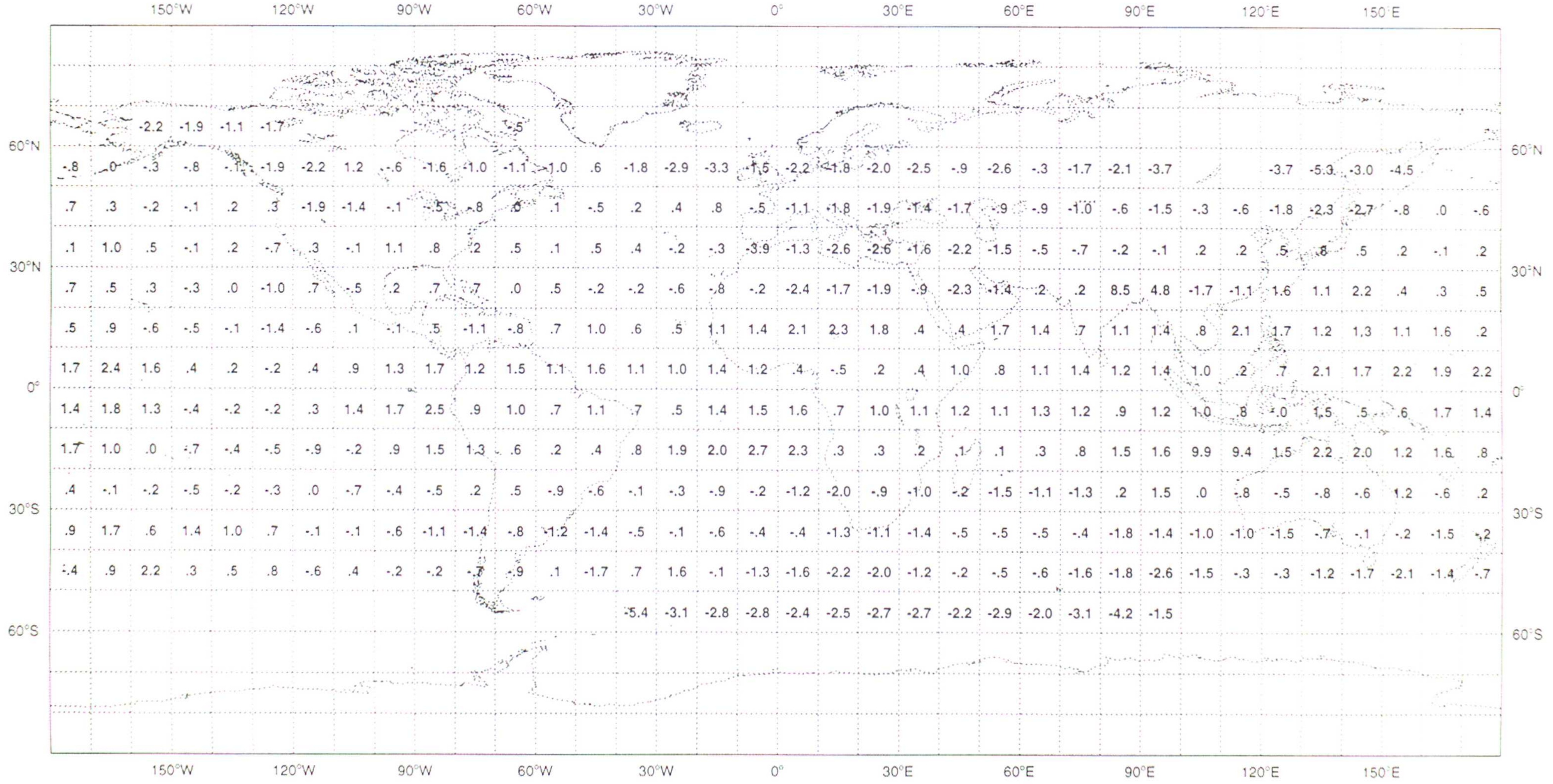
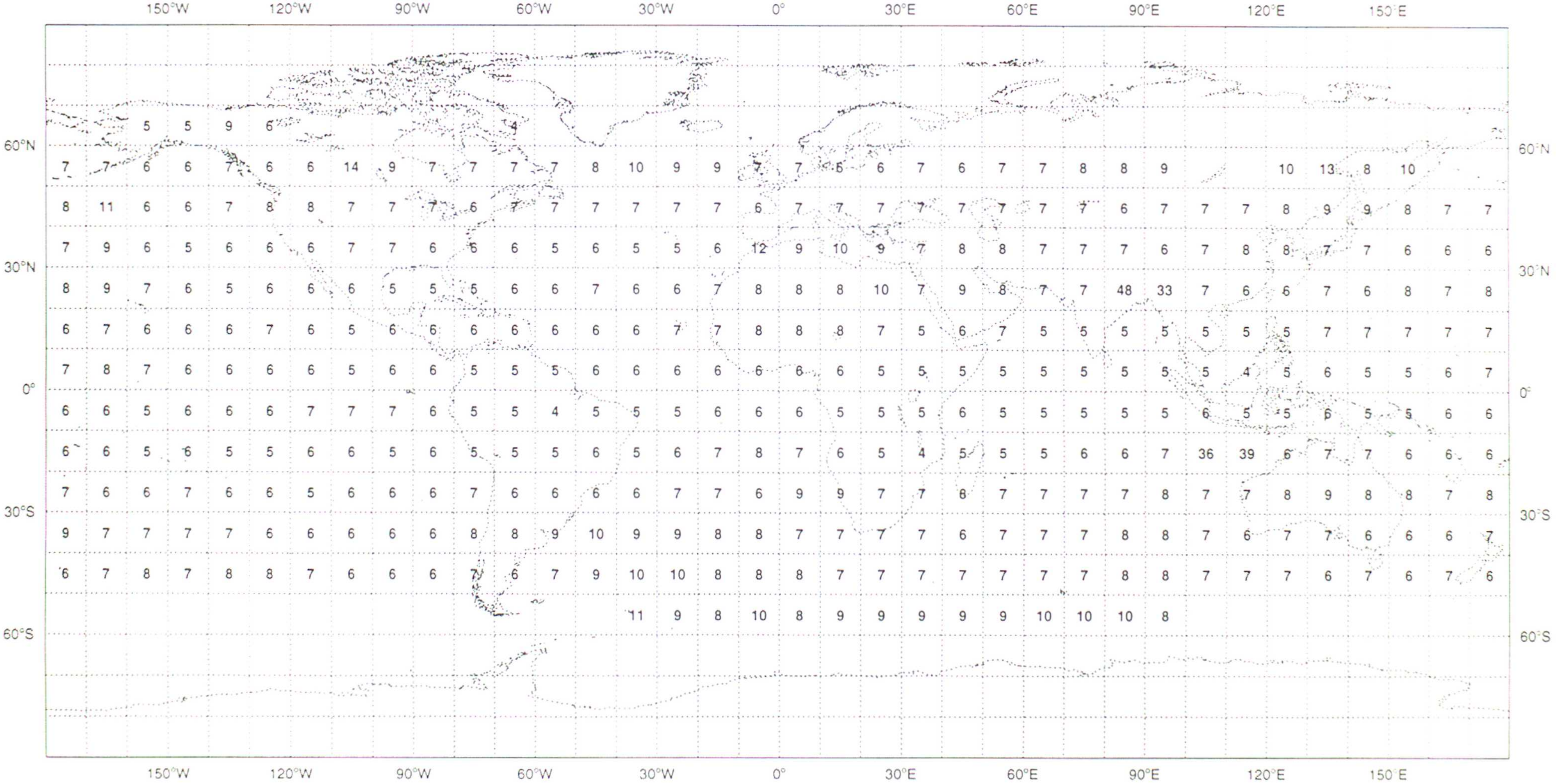

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
-2.2 -1.9 -1.1 -1.7 -.5
-.8 .0 -.3 -.8 -.1 -1.9 -2.2 1.2 -.6 -1.6 -1.0 -1.1 -1.0 .6 -1.8 -2.9 -3.3 -1.5 -2.2 -1.8 -2.0 -2.5 -.9 -2.6 -.3 -1.7 -2.1 -3.7 -3.7 -5.3 -3.0 -4.5
.7 .3 -.2 -.1 .2 .3 -1.9 -1.4 -.1 -.5 -.8 .6 .1 -.5 .2 .4 .8 -.5 -1.1 -1.8 -1.9 -1.4 -1.7 -.9 -.9 -1.0 -.6 -1.5 -.3 -.6 -1.8 -2.3 -2.7 -.8 .0 -.6
.1 1.0 .5 -.1 .2 -.7 .3 -.1 1.1 .8 .2 .5 .1 .5 .4 -.2 -.3 -3.9 -1.3 -2.6 -2.6 -1.6 -2.2 -1.5 -.5 -.7 -.2 -.1 .2 .2 .5 .8 .5 .2 -.1 .2
.7 .5 .3 -.3 .0 -1.0 .7 -.5 .2 .7 .7 .0 .5 -.2 -.2 -.6 -.8 -.2 -2.4 -1.7 -1.9 -.9 -2.3 -1.4 .2 .2 8.5 4.8 -1.7 -1.1 1.6 1.1 2.2 .4 .3 .5
.5 .9 -.6 -.5 -.1 -1.4 -.6 .1 -.1 .5 -1.1 -.8 .7 1.0 .6 .5 1.1 1.4 2.1 2.3 1.8 .4 .4 1.7 1.4 .7 1.1 1.4 .8 2.1 1.7 1.2 1.3 1.1 1.6 .2
1.7 2.4 1.6 .4 .2 -.2 .4 .9 1.3 1.7 1.2 1.5 1.1 1.6 1.1 1.0 1.4 1.2 .4 -.5 .2 .4 1.0 .8 1.1 1.4 1.2 1.4 1.0 .2 .7 2.1 1.7 2.2 1.9 2.2
1.4 1.8 1.3 -.4 -.2 -.2 .3 1.4 1.7 2.5 .9 1.0 .7 1.1 .7 .5 1.4 1.5 1.6 .7 1.0 1.1 1.2 1.1 1.3 1.2 .9 1.2 1.0 .8 .0 1.5 .5 .6 1.7 1.4
1.7 1.0 .0 -.7 -.4 -.5 -.9 -.2 .9 1.5 1.3 .6 .2 .4 .8 1.9 2.0 2.7 2.3 .3 .3 .2 .1 .1 .3 .8 1.5 1.6 9.9 9.4 1.5 2.2 2.0 1.2 1.6 .8
.4 -.1 -.2 -.5 -.2 -.3 .0 -.7 -.4 -.5 .2 .5 -.9 -.6 -.1 -.3 -.9 -.2 -1.2 -2.0 -.9 -1.0 -.2 -1.5 -1.1 -1.3 .2 1.5 .0 -.8 -.5 -.8 -.6 1.2 -.6 .2
.9 1.7 .6 1.4 1.0 .7 -.1 -.1 -.6 -1.1 -1.4 -.8 -1.2 -1.4 -.5 -.1 -.6 -.4 -.4 -1.3 -1.1 -1.4 -.5 -.5 -.5 -.4 -1.8 -1.4 -1.0 -1.0 -1.5 -.7 -.1 -.2 -1.5 -.2
-.4 .9 2.2 .3 .5 .8 -.6 .4 -.2 -.2 -.7 -.9 .1 -1.7 .7 1.6 -.1 -1.3 -1.6 -2.2 -2.0 -1.2 -.2 -.5 -.6 -1.6 -1.8 -2.6 -1.5 -.3 -.3 -1.2 -1.7 -2.1 -1.4 -.7
-5.4 -3.1 -2.8 -2.8 -2.4 -2.5 -2.7 -2.7 -2.2 -2.9 -2.0 -3.1 -4.2 -1.5
150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E

Figure 24. SATOB 101 - 400 hPa RMS O-B vector differences (ms-1). APRIL 2002
All observations
Values are plotted where greater than 10 obs are present


150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
5 5 9 6 4
7 7 6 6 7 6 6 14 9 7 7 7 7 8 10 9 9 7 7 5 6 7 6 7 7 8 8 9 10 13 8 10
8 11 6 6 7 8 8 7 7 7 6 7 7 7 7 7 7 6 7 7 7 7 7 7 7 7 6 7 7 7 8 9 9 8 7 7
7 9 6 5 6 6 6 7 7 6 6 6 5 6 5 5 6 12 9 10 9 7 8 8 7 7 7 6 7 8 8 7 7 6 6 6
8 9 7 6 5 6 6 6 5 5 5 6 6 7 6 6 7 8 8 8 10 7 9 8 7 7 48 33 7 6 6 7 6 8 7 8
6 7 6 6 6 7 6 5 6 6 6 6 6 6 6 7 7 8 8 8 7 5 6 7 5 5 5 5 5 5 5 7 7 7 7 7
7 8 7 6 6 6 6 5 6 6 5 5 5 6 6 6 6 6 6 6 5 5 5 5 5 5 5 5 5 4 5 6 5 5 6 7
6 6 5 6 6 6 7 7 7 6 5 5 4 5 5 5 6 6 6 5 5 5 6 5 5 5 5 5 6 5 5 6 5 5 6 6
6 6 5 6 5 5 6 6 5 6 5 5 5 6 5 6 7 8 7 6 5 4 5 5 5 6 6 7 36 39 6 7 7 6 6 6
7 6 6 7 6 6 5 6 6 6 7 6 6 6 6 7 7 6 9 9 7 7 6 7 7 7 7 8 7 7 8 9 8 8 7 8
9 7 7 7 7 6 6 6 6 6 8 8 9 10 9 9 8 8 7 7 7 7 6 7 7 7 8 8 7 6 7 7 6 6 6 7
6 7 8 7 8 8 7 6 6 6 7 6 7 9 10 10 8 8 8 7 7 7 7 7 7 7 8 8 7 7 7 6 7 6 7 6
11 9 8 10 8 9 9 9 9 9 10 10 10 8
150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S

MONITORING OF SATELLITE TEMPERATURES

MONITORING CENTRE: BRACKNELL

MONTH: April 2002

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from NOAA-15 and NOAA-16.

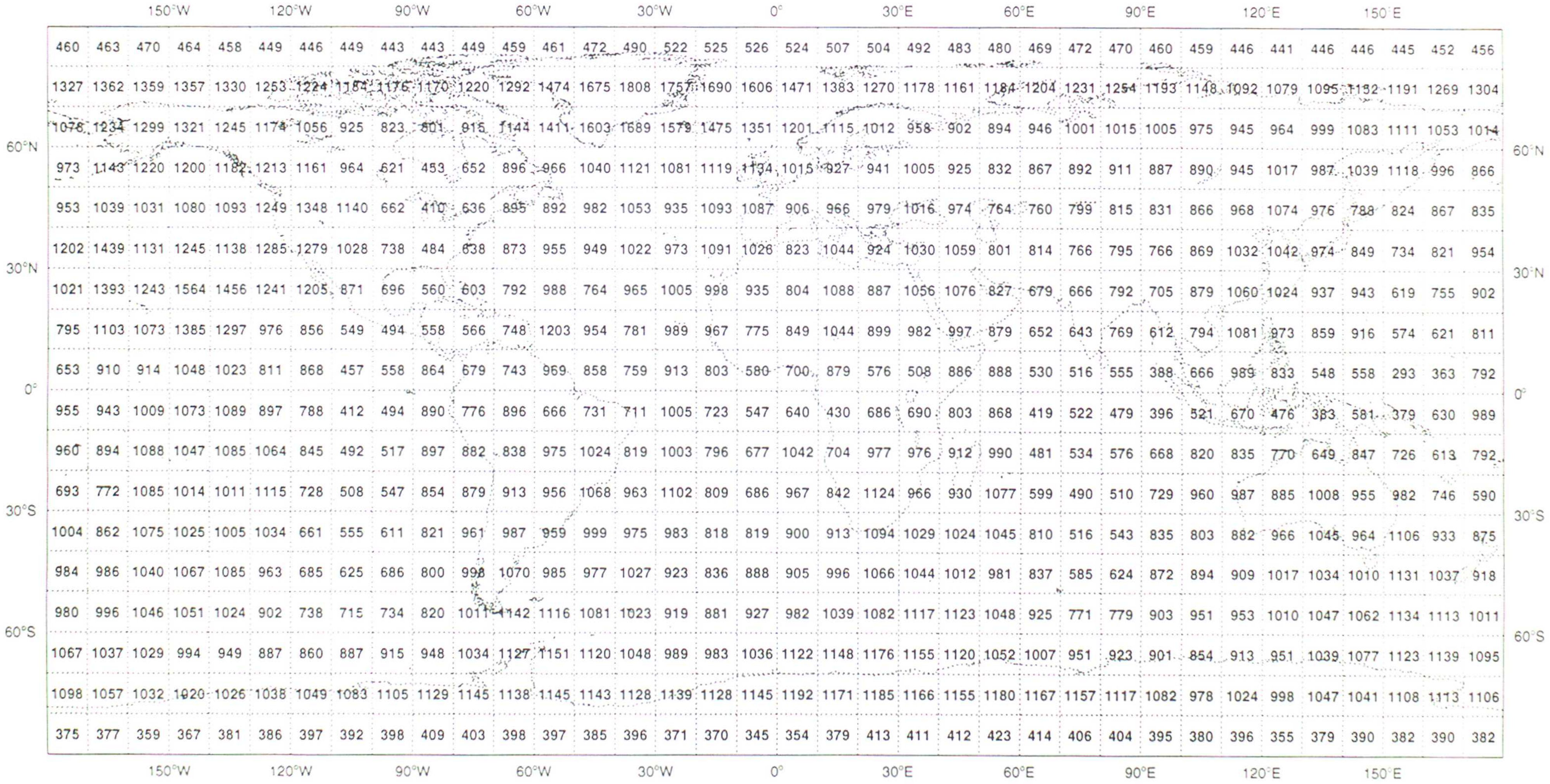
Standard of comparison :Background field from UKMO global model.

Selection Criteria :All soundings.

Data Extracted :Sounding channels (and approximate weighting function peaks, hPa)
HIRS8 (Surface)
HIRS15 (700)
HIRS11 (500-700)
HIRS4 (400)
AMSUA5 (700)
AMSUA7 (300)
AMSUA9 (100)

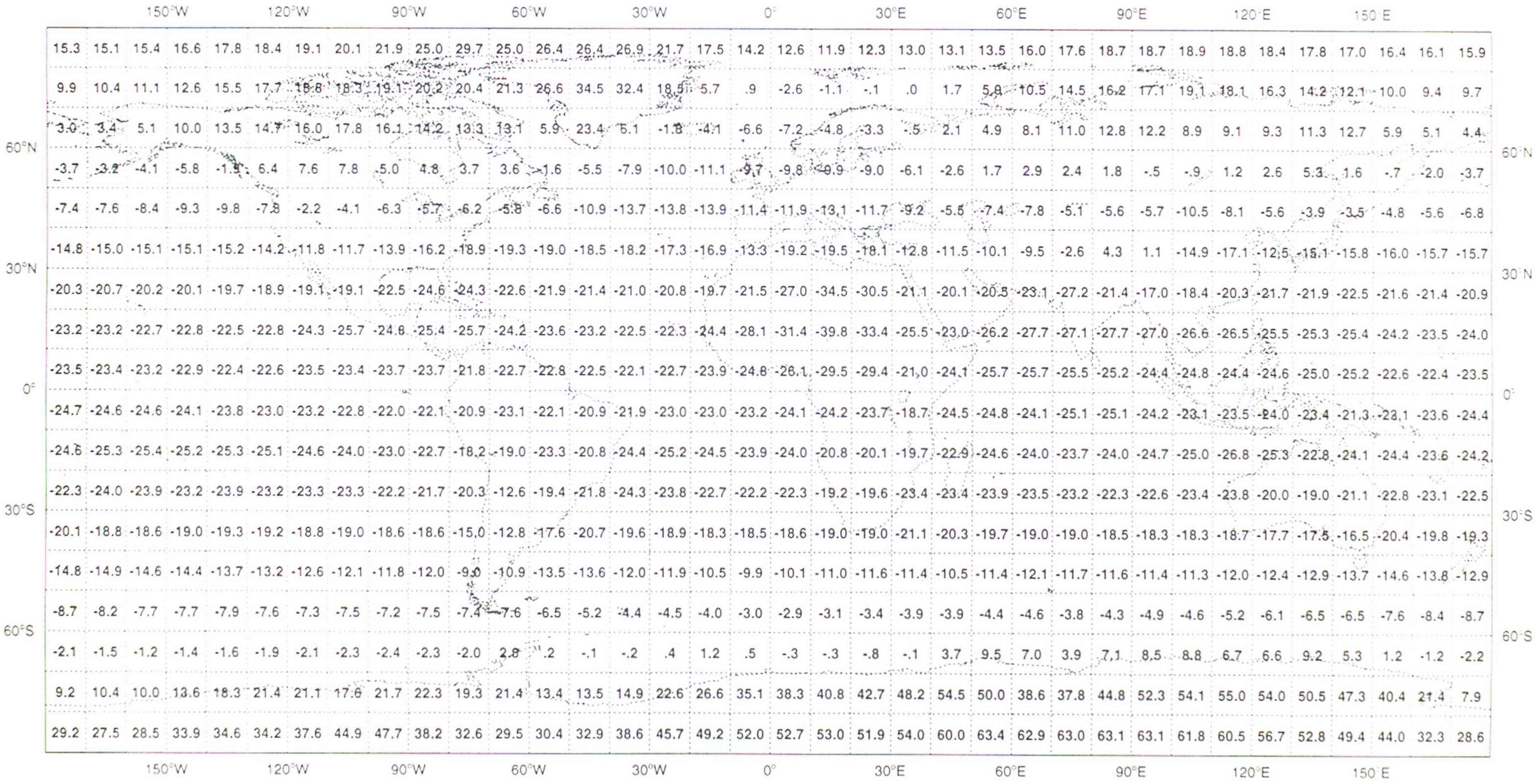
:Mean and standard deviation observation-minus-background brightness temperature differences

Figure 25. ATOVS mean daily count. APRIL 2002
NOAA15, using all observations
Global average number of observations in 24 hours = 576254



460	463	470	464	458	449	446	449	443	443	449	459	461	472	490	522	525	526	524	507	504	492	483	480	469	472	470	460	459	446	441	446	446	445	452	456
1327	1362	1359	1357	1330	1253	1224	1184	1176	1170	1220	1292	1474	1675	1808	1757	1690	1606	1471	1383	1270	1178	1161	1184	1204	1231	1254	1193	1148	1092	1079	1095	1152	1191	1269	1304
1078	1234	1299	1321	1245	1174	1056	925	823	801	915	1144	1411	1603	1689	1579	1475	1351	1201	1115	1012	958	902	894	946	1001	1015	1005	975	945	964	999	1083	1111	1053	1014
973	1143	1220	1200	1182	1213	1161	964	621	453	652	896	966	1040	1121	1081	1119	1134	1015	927	941	1005	925	832	867	892	911	887	890	945	1017	987	1039	1118	996	866
953	1039	1031	1080	1093	1249	1348	1140	662	410	636	895	892	982	1053	935	1093	1087	906	966	979	1016	974	764	760	799	815	831	866	968	1074	976	788	824	867	835
1202	1439	1131	1245	1138	1285	1279	1028	738	484	638	873	955	949	1022	973	1091	1026	823	1044	924	1030	1059	801	814	766	795	766	869	1032	1042	974	849	734	821	954
1021	1393	1243	1564	1456	1241	1205	871	696	560	603	792	988	764	965	1005	998	935	804	1088	887	1056	1076	827	679	666	792	705	879	1060	1024	937	943	619	755	902
795	1103	1073	1385	1297	976	856	549	494	558	566	748	1203	954	781	989	967	775	849	1044	899	982	997	879	652	643	769	612	794	1081	973	859	916	574	621	811
653	910	914	1048	1023	811	868	457	558	864	679	743	969	858	759	913	803	580	700	879	576	508	886	888	530	516	555	388	666	989	833	548	558	293	363	792
955	943	1009	1073	1089	897	788	412	494	890	776	896	666	731	711	1005	723	547	640	430	686	690	803	868	419	522	479	396	521	670	476	383	581	379	630	989
960	894	1088	1047	1085	1064	845	492	517	897	882	838	975	1024	819	1003	796	677	1042	704	977	976	912	990	481	534	576	668	820	835	770	649	847	726	613	792
693	772	1085	1014	1011	1115	728	508	547	854	879	913	956	1068	963	1102	809	686	967	842	1124	966	930	1077	599	490	510	729	960	987	885	1008	955	982	746	590
1004	862	1075	1025	1005	1034	661	555	611	821	961	987	959	999	975	983	818	819	900	913	1094	1029	1024	1045	810	516	543	835	803	882	966	1045	964	1106	933	875
984	986	1040	1067	1085	963	685	625	686	800	998	1070	985	977	1027	923	836	888	905	996	1066	1044	1012	981	837	585	624	872	894	909	1017	1034	1010	1131	1037	918
980	996	1046	1051	1024	902	738	715	734	820	1011	1142	1116	1081	1023	919	881	927	982	1039	1082	1117	1123	1048	925	771	779	903	951	953	1010	1047	1062	1134	1113	1011
1067	1037	1029	994	949	887	860	887	915	948	1034	1127	1151	1120	1048	989	983	1036	1122	1148	1176	1155	1120	1052	1007	951	923	901	854	913	951	1039	1077	1123	1139	1095
1098	1057	1032	1020	1026	1038	1049	1083	1105	1129	1145	1138	1145	1143	1128	1139	1128	1145	1192	1171	1185	1166	1155	1180	1167	1157	1117	1082	978	1024	998	1047	1041	1108	1113	1106
375	377	359	367	381	386	397	392	398	409	403	398	397	385	396	371	370	345	354	379	413	411	412	423	414	406	404	395	380	396	355	379	390	382	390	382

Figure 26. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2002
Channel: HIRS8 (Surface)
NOAA15, using all observations



15.3	15.1	15.4	16.6	17.8	18.4	19.1	20.1	21.9	25.0	29.7	25.0	26.4	26.4	26.9	21.7	17.5	14.2	12.6	11.9	12.3	13.0	13.1	13.5	16.0	17.6	18.7	18.7	18.9	18.8	18.4	17.8	17.0	16.4	16.1	15.9
9.9	10.4	11.1	12.6	15.5	17.7	18.8	18.3	19.1	20.2	20.4	21.3	26.6	34.5	32.4	18.5	5.7	.9	-2.6	-1.1	-.1	.0	1.7	5.8	10.5	14.5	16.2	17.1	19.1	18.1	16.3	14.2	12.1	10.0	9.4	9.7
3.0	3.4	5.1	10.0	13.5	14.7	16.0	17.8	16.1	14.2	13.3	13.1	5.9	23.4	6.1	-1.8	-4.1	-6.6	-7.2	-4.8	-3.3	-.5	2.1	4.9	8.1	11.0	12.8	12.2	8.9	9.1	9.3	11.3	12.7	5.9	5.1	4.4
-3.7	-3.2	-4.1	-5.8	-1.5	6.4	7.6	7.8	5.0	4.8	3.7	3.6	-1.6	-5.5	-7.9	-10.0	-11.1	-9.7	-9.8	-9.9	-9.0	-6.1	-2.6	1.7	2.9	2.4	1.8	-.5	-.9	1.2	2.6	5.3	1.6	-.7	-2.0	-3.7
-7.4	-7.6	-8.4	-9.3	-9.8	-7.8	-2.2	-4.1	-6.3	-5.7	-6.2	-5.8	-6.6	-10.9	-13.7	-13.8	-13.9	-11.4	-11.9	-13.1	-11.7	-9.2	-5.5	-7.4	-7.8	-5.1	-5.6	-5.7	-10.5	-8.1	-5.6	-3.9	-3.5	-4.8	-5.6	-6.8
-14.8	-15.0	-15.1	-15.1	-15.2	-14.2	-11.8	-11.7	-13.9	-16.2	-18.9	-19.3	-19.0	-18.5	-18.2	-17.3	-16.9	-13.3	-19.2	-19.5	-18.1	-12.8	-11.5	-10.1	-9.5	-2.6	4.3	1.1	-14.9	-17.1	-12.5	-15.1	-15.8	-16.0	-15.7	-15.7
-20.3	-20.7	-20.2	-20.1	-19.7	-18.9	-19.1	-19.1	-22.5	-24.6	-24.3	-22.6	-21.9	-21.4	-21.0	-20.8	-19.7	-21.5	-27.0	-34.5	-30.5	-21.1	-20.1	-20.5	-23.1	-27.2	-21.4	-17.0	-18.4	-20.3	-21.7	-21.9	-22.5	-21.6	-21.4	-20.9
-23.2	-23.2	-22.7	-22.8	-22.5	-22.8	-24.3	-25.7	-24.8	-25.4	-25.7	-24.2	-23.6	-23.2	-22.5	-22.3	-24.4	-28.1	-31.4	-39.8	-33.4	-25.5	-23.0	-26.2	-27.7	-27.1	-27.7	-27.0	-26.6	-26.5	-25.5	-25.3	-25.4	-24.2	-23.5	-24.0
-23.5	-23.4	-23.2	-22.9	-22.4	-22.6	-23.5	-23.4	-23.7	-23.7	-21.8	-22.7	-22.8	-22.5	-22.1	-22.7	-23.9	-24.8	-26.1	-29.5	-29.4	-21.0	-24.1	-25.7	-25.7	-25.5	-25.2	-24.4	-24.8	-24.4	-24.6	-25.0	-25.2	-22.6	-22.4	-23.5
-24.7	-24.6	-24.6	-24.1	-23.8	-23.0	-23.2	-22.8	-22.0	-22.1	-20.9	-23.1	-22.1	-20.9	-21.9	-23.0	-23.0	-23.2	-24.1	-24.2	-23.7	-18.7	-24.5	-24.8	-24.1	-25.1	-25.1	-24.2	-23.1	-23.5	-24.0	-23.4	-21.3	-23.1	-23.6	-24.4
-24.6	-25.3	-25.4	-25.2	-25.3	-25.1	-24.6	-24.0	-23.0	-22.7	-18.2	-19.0	-23.3	-20.8	-24.4	-25.2	-24.5	-23.9	-24.0	-20.8	-20.1	-19.7	-22.9	-24.6	-24.0	-23.7	-24.0	-24.7	-25.0	-26.8	-25.3	-22.8	-24.1	-24.4	-23.6	-24.2
-22.3	-24.0	-23.9	-23.2	-23.9	-23.2	-23.3	-23.3	-22.2	-21.7	-20.3	-12.6	-19.4	-21.8	-24.3	-23.8	-22.7	-22.2	-22.3	-19.2	-19.6	-23.4	-23.4	-23.9	-23.5	-23.2	-22.3	-22.6	-23.4	-23.8	-20.0	-19.0	-21.1	-22.8	-23.1	-22.5
-20.1	-18.8	-18.6	-19.0	-19.3	-19.2	-18.8	-19.0	-18.6	-18.6	-15.0	-12.8	-17.6	-20.7	-19.6	-18.9	-18.3	-18.5	-18.6	-19.0	-19.0	-21.1	-20.3	-19.7	-19.0	-19.0	-18.5	-18.3	-18.3	-18.7	-17.7	-17.5	-16.5	-20.4	-19.8	-19.3
-14.8	-14.9	-14.6	-14.4	-13.7	-13.2	-12.6	-12.1	-11.8	-12.0	-9.0	-10.9	-13.5	-13.6	-12.0	-11.9	-10.5	-9.9	-10.1	-11.0	-11.6	-11.4	-10.5	-11.4	-12.1	-11.7	-11.6	-11.4	-11.3	-12.0	-12.4	-12.9	-13.7	-14.6	-13.8	-12.9
-8.7	-8.2	-7.7	-7.7	-7.9	-7.6	-7.3	-7.5	-7.2	-7.5	-7.4	-7.6	-6.5	-5.2	-4.4	-4.5	-4.0	-3.0	-2.9	-3.1	-3.4	-3.9	-3.9	-4.4	-4.6	-3.8	-4.3	-4.9	-4.6	-5.2	-6.1	-6.5	-6.5	-7.6	-8.4	-8.7
-2.1	-1.5	-1.2	-1.4	-1.6	-1.9	-2.1	-2.3	-2.4	-2.3	-2.0	2.8	.2	-.1	-.2	.4	1.2	.5	-.3	-.3	-.8	-.1	3.7	9.5	7.0	3.9	7.1	8.5	8.8	6.7	6.6	9.2	5.3	1.2	-1.2	-2.2
9.2	10.4	10.0	13.6	18.3	21.4	21.1	17.6	21.7	22.3	19.3	21.4	13.4	13.5	14.9	22.6	26.6	35.1	38.3	40.8	42.7	48.2	54.5	50.0	38.6	37.8	44.8	52.3	54.1	55.0	54.0	50.5	47.3	40.4	21.4	7.9
29.2	27.5	28.5	33.9	34.6	34.2	37.6	44.9	47.7	38.2	32.6	29.5	30.4	32.9	38.6	45.7	49.2	52.0	52.7	53.0	51.9	54.0	60.0	63.4	62.9	63.0	63.1	63.1	61.8	60.5	56.7	52.8	49.4	44.0	32.3	28.6

Figure 27. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2002
Channel: HIRS8 (Surface)
NOAA15, using all observations

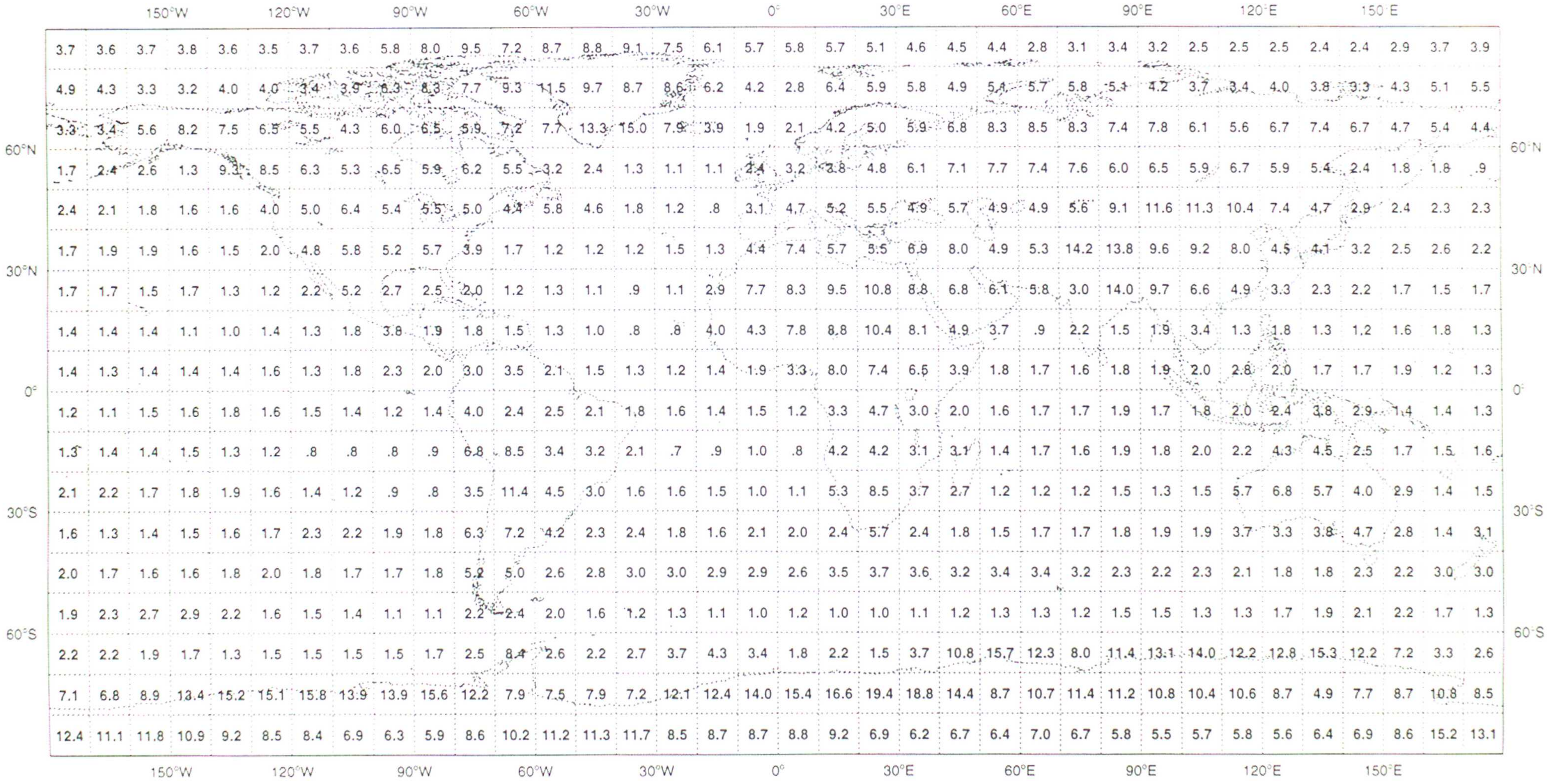
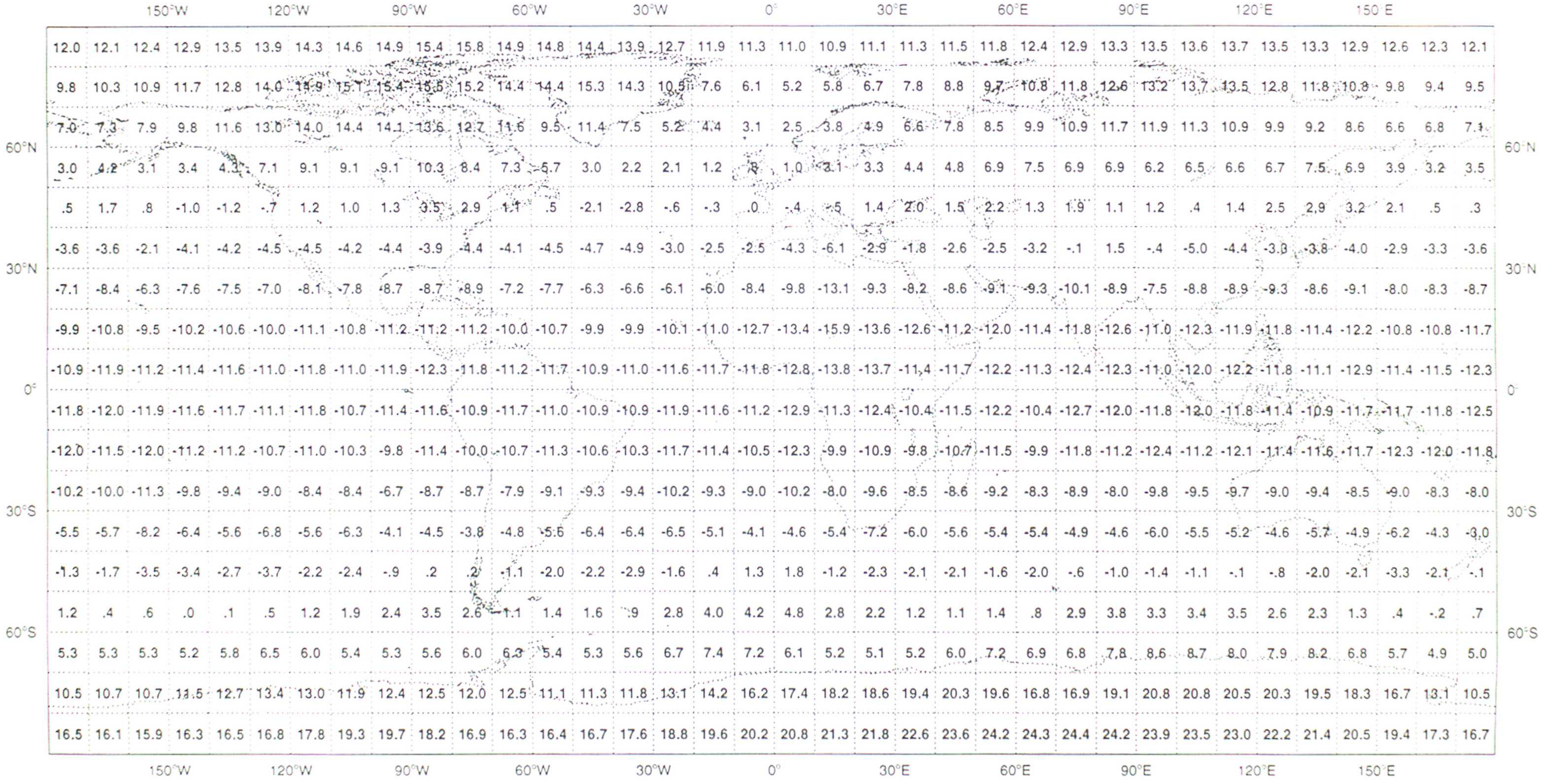
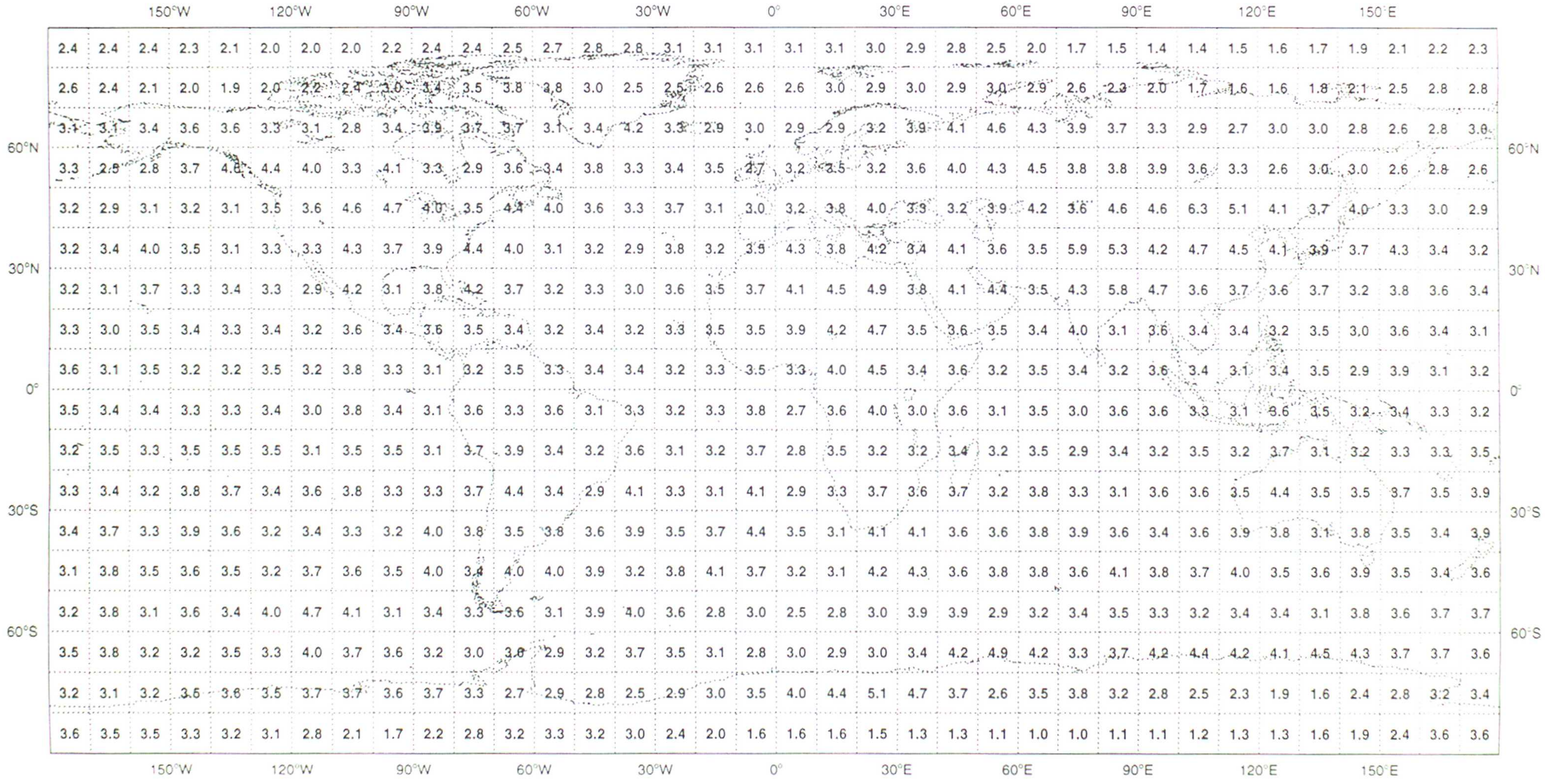

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
3.7 3.6 3.7 3.8 3.6 3.5 3.7 3.6 5.8 8.0 9.5 7.2 8.7 8.8 9.1 7.5 6.1 5.7 5.8 5.7 5.1 4.6 4.5 4.4 2.8 3.1 3.4 3.2 2.5 2.5 2.5 2.4 2.4 2.9 3.7 3.9
4.9 4.3 3.3 3.2 4.0 4.0 3.4 3.9 6.3 8.3 7.7 9.3 11.5 9.7 8.7 8.6 6.2 4.2 2.8 6.4 5.9 5.8 4.9 5.4 5.7 5.8 5.4 4.2 3.7 3.4 4.0 3.8 3.3 4.3 5.1 5.5
3.3 3.4 5.6 8.2 7.5 6.5 5.5 4.3 6.0 6.5 5.9 7.2 7.7 13.3 15.0 7.9 3.9 1.9 2.1 4.2 5.0 5.9 6.8 8.3 8.5 8.3 7.4 7.8 6.1 5.6 6.7 7.4 6.7 4.7 5.4 4.4
1.7 2.4 2.6 1.3 9.3 8.5 6.3 5.3 6.5 5.9 6.2 5.5 3.2 2.4 1.3 1.1 1.1 2.4 3.2 3.8 4.8 6.1 7.1 7.7 7.4 7.6 6.0 6.5 5.9 6.7 5.9 5.4 2.4 1.8 1.8 .9
2.4 2.1 1.8 1.6 1.6 4.0 5.0 6.4 5.4 5.5 5.0 4.4 5.8 4.6 1.8 1.2 .8 3.1 4.7 5.2 5.5 4.9 5.7 4.9 4.9 5.6 9.1 11.6 11.3 10.4 7.4 4.7 2.9 2.4 2.3 2.3
1.7 1.9 1.9 1.6 1.5 2.0 4.8 5.8 5.2 5.7 3.9 1.7 1.2 1.2 1.2 1.5 1.3 4.4 7.4 5.7 5.5 6.9 8.0 4.9 5.3 14.2 13.8 9.6 9.2 8.0 4.5 4.1 3.2 2.5 2.6 2.2
1.7 1.7 1.5 1.7 1.3 1.2 2.2 5.2 2.7 2.5 2.0 1.2 1.3 1.1 .9 1.1 2.9 7.7 8.3 9.5 10.8 8.8 6.8 6.1 5.8 3.0 14.0 9.7 6.6 4.9 3.3 2.3 2.2 1.7 1.5 1.7
1.4 1.4 1.4 1.1 1.0 1.4 1.3 1.8 3.8 1.9 1.8 1.5 1.3 1.0 .8 .8 4.0 4.3 7.8 8.8 10.4 8.1 4.9 3.7 .9 2.2 1.5 1.9 3.4 1.3 1.8 1.3 1.2 1.6 1.8 1.3
1.4 1.3 1.4 1.4 1.4 1.6 1.3 1.8 2.3 2.0 3.0 3.5 2.1 1.5 1.3 1.2 1.4 1.9 3.3 8.0 7.4 6.5 3.9 1.8 1.7 1.6 1.8 1.9 2.0 2.8 2.0 1.7 1.7 1.9 1.2 1.3
1.2 1.1 1.5 1.6 1.8 1.6 1.5 1.4 1.2 1.4 4.0 2.4 2.5 2.1 1.8 1.6 1.4 1.5 1.2 3.3 4.7 3.0 2.0 1.6 1.7 1.7 1.9 1.7 1.8 2.0 2.4 3.8 2.9 1.4 1.4 1.3
1.3 1.4 1.4 1.5 1.3 1.2 .8 .8 .8 .9 6.8 8.5 3.4 3.2 2.1 .7 .9 1.0 .8 4.2 4.2 3.1 3.1 1.4 1.7 1.6 1.9 1.8 2.0 2.2 4.3 4.5 2.5 1.7 1.5 1.6
2.1 2.2 1.7 1.8 1.9 1.6 1.4 1.2 .9 .8 3.5 11.4 4.5 3.0 1.6 1.6 1.5 1.0 1.1 5.3 8.5 3.7 2.7 1.2 1.2 1.2 1.5 1.3 1.5 5.7 6.8 5.7 4.0 2.9 1.4 1.5
1.6 1.3 1.4 1.5 1.6 1.7 2.3 2.2 1.9 1.8 6.3 7.2 4.2 2.3 2.4 1.8 1.6 2.1 2.0 2.4 5.7 2.4 1.8 1.5 1.7 1.7 1.8 1.9 1.9 3.7 3.3 3.8 4.7 2.8 1.4 3.1
2.0 1.7 1.6 1.6 1.8 2.0 1.8 1.7 1.7 1.8 5.2 5.0 2.6 2.8 3.0 3.0 2.9 2.9 2.6 3.5 3.7 3.6 3.2 3.4 3.4 3.2 2.3 2.2 2.3 2.1 1.8 1.8 2.3 2.2 3.0 3.0
1.9 2.3 2.7 2.9 2.2 1.6 1.5 1.4 1.1 1.1 2.2 2.4 2.0 1.6 1.2 1.3 1.1 1.0 1.2 1.0 1.0 1.1 1.2 1.3 1.3 1.2 1.5 1.5 1.3 1.3 1.7 1.9 2.1 2.2 1.7 1.3
2.2 2.2 1.9 1.7 1.3 1.5 1.5 1.5 1.5 1.7 2.5 8.4 2.6 2.2 2.7 3.7 4.3 3.4 1.8 2.2 1.5 3.7 10.8 15.7 12.3 8.0 11.4 13.1 14.0 12.2 12.8 15.3 12.2 7.2 3.3 2.6
7.1 6.8 8.9 13.4 15.2 15.1 15.8 13.9 13.9 15.6 12.2 7.9 7.5 7.9 7.2 12.1 12.4 14.0 15.4 16.6 19.4 18.8 14.4 8.7 10.7 11.4 11.2 10.8 10.4 10.6 8.7 4.9 7.7 8.7 10.8 8.5
12.4 11.1 11.8 10.9 9.2 8.5 8.4 6.9 6.3 5.9 8.6 10.2 11.2 11.3 11.7 8.5 8.7 8.7 8.8 9.2 6.9 6.2 6.7 6.4 7.0 6.7 5.8 5.5 5.7 5.8 5.6 6.4 6.9 8.6 15.2 13.1

Figure 28. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2002
Channel: HIRS15 (700 hPa)
NOAA15, using all observations



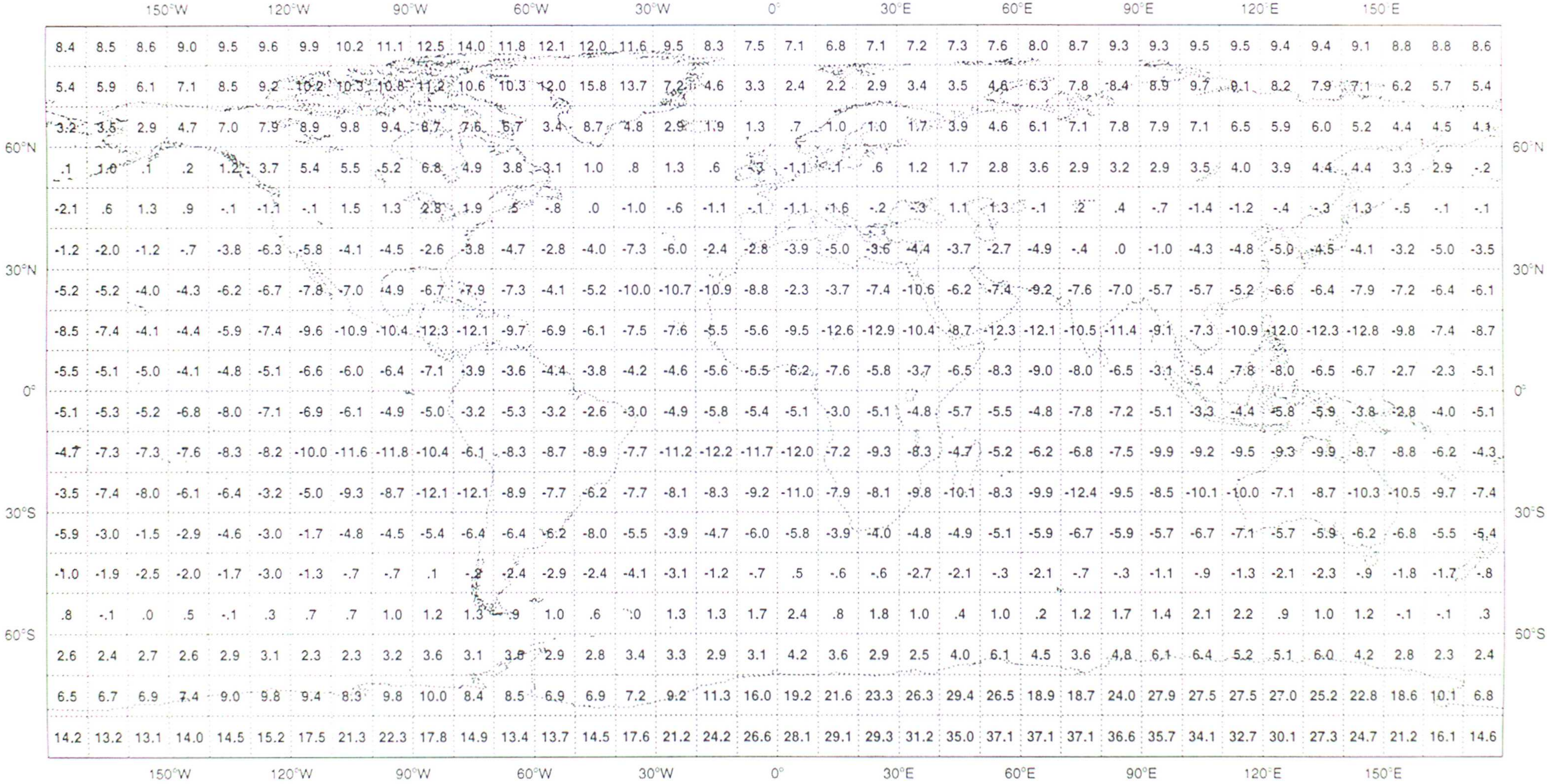
12.0	12.1	12.4	12.9	13.5	13.9	14.3	14.6	14.9	15.4	15.8	14.9	14.8	14.4	13.9	12.7	11.9	11.3	11.0	10.9	11.1	11.3	11.5	11.8	12.4	12.9	13.3	13.5	13.6	13.7	13.5	13.3	12.9	12.6	12.3	12.1
9.8	10.3	10.9	11.7	12.8	14.0	14.9	15.1	15.4	15.5	15.2	14.4	14.4	15.3	14.3	10.5	7.6	6.1	5.2	5.8	6.7	7.8	8.8	9.7	10.8	11.8	12.6	13.2	13.7	13.5	12.8	11.8	10.8	9.8	9.4	9.5
7.0	7.3	7.9	9.8	11.6	13.0	14.0	14.4	14.1	13.6	12.7	11.6	9.5	11.4	7.5	5.2	4.4	3.1	2.5	3.8	4.9	6.6	7.8	8.5	9.9	10.9	11.7	11.9	11.3	10.9	9.9	9.2	8.6	6.6	6.8	7.1
3.0	4.2	3.1	3.4	4.3	7.1	9.1	9.1	9.1	10.3	8.4	7.3	5.7	3.0	2.2	2.1	1.2	.8	1.0	3.1	3.3	4.4	4.8	6.9	7.5	6.9	6.9	6.2	6.5	6.6	6.7	7.5	6.9	3.9	3.2	3.5
.5	1.7	.8	-1.0	-1.2	-.7	1.2	1.0	1.3	3.5	2.9	1.1	.5	-2.1	-2.8	-.6	-.3	.0	-.4	-.5	1.4	2.0	1.5	2.2	1.3	1.9	1.1	1.2	.4	1.4	2.5	2.9	3.2	2.1	.5	.3
-3.6	-3.6	-2.1	-4.1	-4.2	-4.5	-4.5	-4.2	-4.4	-3.9	-4.4	-4.1	-4.5	-4.7	-4.9	-3.0	-2.5	-2.5	-4.3	-6.1	-2.9	-1.8	-2.6	-2.5	-3.2	-.1	1.5	-.4	-5.0	-4.4	-3.3	-3.8	-4.0	-2.9	-3.3	-3.6
-7.1	-8.4	-6.3	-7.6	-7.5	-7.0	-8.1	-7.8	-8.7	-8.7	-8.9	-7.2	-7.7	-6.3	-6.6	-6.1	-6.0	-8.4	-9.8	-13.1	-9.3	-8.2	-8.6	-9.1	-9.3	-10.1	-8.9	-7.5	-8.8	-8.9	-9.3	-8.6	-9.1	-8.0	-8.3	-8.7
-9.9	-10.8	-9.5	-10.2	-10.6	-10.0	-11.1	-10.8	-11.2	-11.2	-11.2	-10.0	-10.7	-9.9	-9.9	-10.1	-11.0	-12.7	-13.4	-15.9	-13.6	-12.6	-11.2	-12.0	-11.4	-11.8	-12.6	-11.0	-12.3	-11.9	-11.8	-11.4	-12.2	-10.8	-10.8	-11.7
-10.9	-11.9	-11.2	-11.4	-11.6	-11.0	-11.8	-11.0	-11.9	-12.3	-11.8	-11.2	-11.7	-10.9	-11.0	-11.6	-11.7	-11.8	-12.8	-13.8	-13.7	-11.4	-11.7	-12.2	-11.3	-12.4	-12.3	-11.0	-12.0	-12.2	-11.8	-11.1	-12.9	-11.4	-11.5	-12.3
-11.8	-12.0	-11.9	-11.6	-11.7	-11.1	-11.8	-10.7	-11.4	-11.6	-10.9	-11.7	-11.0	-10.9	-10.9	-11.9	-11.6	-11.2	-12.9	-11.3	-12.4	-10.4	-11.5	-12.2	-10.4	-12.7	-12.0	-11.8	-12.0	-11.8	-11.4	-10.9	-11.7	-11.7	-11.8	-12.5
-12.0	-11.5	-12.0	-11.2	-11.2	-10.7	-11.0	-10.3	-9.8	-11.4	-10.0	-10.7	-11.3	-10.6	-10.3	-11.7	-11.4	-10.5	-12.3	-9.9	-10.9	-9.8	-10.7	-11.5	-9.9	-11.8	-11.2	-12.4	-11.2	-12.1	-11.4	-11.6	-11.7	-12.3	-12.0	-11.8
-10.2	-10.0	-11.3	-9.8	-9.4	-9.0	-8.4	-8.4	-6.7	-8.7	-8.7	-7.9	-9.1	-9.3	-9.4	-10.2	-9.3	-9.0	-10.2	-8.0	-9.6	-8.5	-8.6	-9.2	-8.3	-8.9	-8.0	-9.8	-9.5	-9.7	-9.0	-9.4	-8.5	-9.0	-8.3	-8.0
-5.5	-5.7	-8.2	-6.4	-5.6	-6.8	-5.6	-6.3	-4.1	-4.5	-3.8	-4.8	-5.6	-6.4	-6.4	-6.5	-5.1	-4.1	-4.6	-5.4	-7.2	-6.0	-5.6	-5.4	-5.4	-4.9	-4.6	-6.0	-5.5	-5.2	-4.6	-5.7	-4.9	-6.2	-4.3	-3.0
-1.3	-1.7	-3.5	-3.4	-2.7	-3.7	-2.2	-2.4	-.9	.2	.2	-1.1	-2.0	-2.2	-2.9	-1.6	.4	1.3	1.8	-1.2	-2.3	-2.1	-2.1	-1.6	-2.0	-.6	-1.0	-1.4	-1.1	-.1	-.8	-2.0	-2.1	-3.3	-2.1	-.1
1.2	.4	.6	.0	.1	.5	1.2	1.9	2.4	3.5	2.6	1.1	1.4	1.6	.9	2.8	4.0	4.2	4.8	2.8	2.2	1.2	1.1	1.4	.8	2.9	3.8	3.3	3.4	3.5	2.6	2.3	1.3	.4	-.2	.7
5.3	5.3	5.3	5.2	5.8	6.5	6.0	5.4	5.3	5.6	6.0	6.3	5.4	5.3	5.6	6.7	7.4	7.2	6.1	5.2	5.1	5.2	6.0	7.2	6.9	6.8	7.8	8.6	8.7	8.0	7.9	8.2	6.8	5.7	4.9	5.0
10.5	10.7	10.7	11.5	12.7	13.4	13.0	11.9	12.4	12.5	12.0	12.5	11.1	11.3	11.8	13.1	14.2	16.2	17.4	18.2	18.6	19.4	20.3	19.6	16.8	16.9	19.1	20.8	20.8	20.5	20.3	19.5	18.3	16.7	13.1	10.5
16.5	16.1	15.9	16.3	16.5	16.8	17.8	19.3	19.7	18.2	16.9	16.3	16.4	16.7	17.6	18.8	19.6	20.2	20.8	21.3	21.8	22.6	23.6	24.2	24.3	24.4	24.2	23.9	23.5	23.0	22.2	21.4	20.5	19.4	17.3	16.7

Figure 29. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2002
Channel: HIRS15 (700 hPa)
NOAA15, using all observations



2.4	2.4	2.4	2.3	2.1	2.0	2.0	2.0	2.2	2.4	2.4	2.5	2.7	2.8	2.8	3.1	3.1	3.1	3.1	3.1	3.0	2.9	2.8	2.5	2.0	1.7	1.5	1.4	1.4	1.5	1.6	1.7	1.9	2.1	2.2	2.3
2.6	2.4	2.1	2.0	1.9	2.0	2.2	2.4	3.0	3.4	3.5	3.8	3.8	3.0	2.5	2.5	2.6	2.6	2.6	3.0	2.9	3.0	2.9	3.0	2.9	2.6	2.3	2.0	1.7	1.6	1.6	1.8	2.1	2.5	2.8	2.8
3.1	3.1	3.4	3.6	3.6	3.3	3.1	2.8	3.4	3.9	3.7	3.7	3.1	3.4	4.2	3.3	2.9	3.0	2.9	2.9	3.2	3.9	4.1	4.6	4.3	3.9	3.7	3.3	2.9	2.7	3.0	3.0	2.8	2.6	2.8	3.8
3.3	2.5	2.8	3.7	4.6	4.4	4.0	3.3	4.1	3.3	2.9	3.6	3.4	3.8	3.3	3.4	3.5	2.7	3.2	3.5	3.2	3.6	4.0	4.3	4.5	3.8	3.8	3.9	3.6	3.3	2.6	3.0	3.0	2.6	2.8	2.6
3.2	2.9	3.1	3.2	3.1	3.5	3.6	4.6	4.7	4.0	3.5	4.4	4.0	3.6	3.3	3.7	3.1	3.0	3.2	3.8	4.0	3.3	3.2	3.9	4.2	3.6	4.6	4.6	6.3	5.1	4.1	3.7	4.0	3.3	3.0	2.9
3.2	3.4	4.0	3.5	3.1	3.3	3.3	4.3	3.7	3.9	4.4	4.0	3.1	3.2	2.9	3.8	3.2	3.5	4.3	3.8	4.2	3.4	4.1	3.6	3.5	5.9	5.3	4.2	4.7	4.5	4.1	3.9	3.7	4.3	3.4	3.2
3.2	3.1	3.7	3.3	3.4	3.3	2.9	4.2	3.1	3.8	4.2	3.7	3.2	3.3	3.0	3.6	3.5	3.7	4.1	4.5	4.9	3.8	4.1	4.4	3.5	4.3	5.8	4.7	3.6	3.7	3.6	3.7	3.2	3.8	3.6	3.4
3.3	3.0	3.5	3.4	3.3	3.4	3.2	3.6	3.4	3.6	3.5	3.4	3.2	3.4	3.2	3.3	3.5	3.5	3.9	4.2	4.7	3.5	3.6	3.5	3.4	4.0	3.1	3.6	3.4	3.4	3.2	3.5	3.0	3.6	3.4	3.1
3.6	3.1	3.5	3.2	3.2	3.5	3.2	3.8	3.3	3.1	3.2	3.5	3.3	3.4	3.4	3.2	3.3	3.5	3.3	4.0	4.5	3.4	3.6	3.2	3.5	3.4	3.2	3.6	3.4	3.1	3.4	3.5	2.9	3.9	3.1	3.2
3.5	3.4	3.4	3.3	3.3	3.4	3.0	3.8	3.4	3.1	3.6	3.3	3.6	3.1	3.3	3.2	3.3	3.8	2.7	3.6	4.0	3.0	3.6	3.1	3.5	3.0	3.6	3.6	3.3	3.1	3.6	3.5	3.2	3.4	3.3	3.2
3.2	3.5	3.3	3.5	3.5	3.5	3.1	3.5	3.5	3.1	3.7	3.9	3.4	3.2	3.6	3.1	3.2	3.7	2.8	3.5	3.2	3.2	3.4	3.2	3.5	2.9	3.4	3.2	3.5	3.2	3.7	3.1	3.2	3.3	3.3	3.5
3.3	3.4	3.2	3.8	3.7	3.4	3.6	3.8	3.3	3.3	3.7	4.4	3.4	2.9	4.1	3.3	3.1	4.1	2.9	3.3	3.7	3.6	3.7	3.2	3.8	3.3	3.1	3.6	3.6	3.5	4.4	3.5	3.5	3.7	3.5	3.9
3.4	3.7	3.3	3.9	3.6	3.2	3.4	3.3	3.2	4.0	3.8	3.5	3.8	3.6	3.9	3.5	3.7	4.4	3.5	3.1	4.1	4.1	3.6	3.6	3.8	3.9	3.6	3.4	3.6	3.9	3.8	3.1	3.8	3.5	3.4	3.9
3.1	3.8	3.5	3.6	3.5	3.2	3.7	3.6	3.5	4.0	3.4	4.0	4.0	3.9	3.2	3.8	4.1	3.7	3.2	3.1	4.2	4.3	3.6	3.8	3.8	3.6	4.1	3.8	3.7	4.0	3.5	3.6	3.9	3.5	3.4	3.6
3.2	3.8	3.1	3.6	3.4	4.0	4.7	4.1	3.1	3.4	3.3	3.6	3.1	3.9	4.0	3.6	2.8	3.0	2.5	2.8	3.0	3.9	3.9	2.9	3.2	3.4	3.5	3.3	3.2	3.4	3.4	3.1	3.8	3.6	3.7	3.7
3.5	3.8	3.2	3.2	3.5	3.3	4.0	3.7	3.6	3.2	3.0	3.6	2.9	3.2	3.7	3.5	3.1	2.8	3.0	2.9	3.0	3.4	4.2	4.9	4.2	3.3	3.7	4.2	4.4	4.2	4.1	4.5	4.3	3.7	3.7	3.6
3.2	3.1	3.2	3.5	3.6	3.5	3.7	3.7	3.6	3.7	3.3	2.7	2.9	2.8	2.5	2.9	3.0	3.5	4.0	4.4	5.1	4.7	3.7	2.6	3.5	3.8	3.2	2.8	2.5	2.3	1.9	1.6	2.4	2.8	3.2	3.4
3.6	3.5	3.5	3.3	3.2	3.1	2.8	2.1	1.7	2.2	2.8	3.2	3.3	3.2	3.0	2.4	2.0	1.6	1.6	1.6	1.5	1.3	1.3	1.1	1.0	1.0	1.1	1.1	1.2	1.3	1.3	1.6	1.9	2.4	3.6	3.6

Figure 30. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2002
Channel: HIRS11 (500 - 700 hPa)
NOAA15, using all observations



8.4	8.5	8.6	9.0	9.5	9.6	9.9	10.2	11.1	12.5	14.0	11.8	12.1	12.0	11.6	9.5	8.3	7.5	7.1	6.8	7.1	7.2	7.3	7.6	8.0	8.7	9.3	9.3	9.5	9.5	9.4	9.4	9.1	8.8	8.8	8.6
5.4	5.9	6.1	7.1	8.5	9.2	10.2	10.3	10.8	11.2	10.6	10.3	12.0	15.8	13.7	7.2	4.6	3.3	2.4	2.2	2.9	3.4	3.5	4.6	6.3	7.8	8.4	8.9	9.7	9.1	8.2	7.9	7.1	6.2	5.7	5.4
3.2	3.5	2.9	4.7	7.0	7.9	8.9	9.8	9.4	8.7	7.6	6.7	3.4	8.7	4.8	2.9	1.9	1.3	.7	1.0	1.0	1.7	3.9	4.6	6.1	7.1	7.8	7.9	7.1	6.5	5.9	6.0	5.2	4.4	4.5	4.1
.1	1.0	.1	.2	1.2	3.7	5.4	5.5	5.2	6.8	4.9	3.8	3.1	1.0	.8	1.3	.6	-.3	-1.1	-.1	.6	1.2	1.7	2.8	3.6	2.9	3.2	2.9	3.5	4.0	3.9	4.4	4.4	3.3	2.9	-.2
-2.1	.6	1.3	.9	-.1	-1.1	-.1	1.5	1.3	2.8	1.9	.5	-.8	.0	-1.0	-.6	-1.1	-.1	-1.1	-1.6	-.2	-.3	1.1	1.3	-.1	.2	.4	-.7	-1.4	-1.2	-.4	-.3	1.3	-.5	-.1	-.1
-1.2	-2.0	-1.2	-.7	-3.8	-6.3	-5.8	-4.1	-4.5	-2.6	-3.8	-4.7	-2.8	-4.0	-7.3	-6.0	-2.4	-2.8	-3.9	-5.0	-3.6	-4.4	-3.7	-2.7	-4.9	-.4	.0	-1.0	-4.3	-4.8	-5.0	-4.5	-4.1	-3.2	-5.0	-3.5
-5.2	-5.2	-4.0	-4.3	-6.2	-6.7	-7.8	-7.0	-4.9	-6.7	-7.9	-7.3	-4.1	-5.2	-10.0	-10.7	-10.9	-8.8	-2.3	-3.7	-7.4	-10.6	-6.2	-7.4	-9.2	-7.6	-7.0	-5.7	-5.7	-5.2	-6.6	-6.4	-7.9	-7.2	-6.4	-6.1
-8.5	-7.4	-4.1	-4.4	-5.9	-7.4	-9.6	-10.9	-10.4	-12.3	-12.1	-9.7	-6.9	-6.1	-7.5	-7.6	-5.5	-5.6	-9.5	-12.6	-12.9	-10.4	-8.7	-12.3	-12.1	-10.5	-11.4	-9.1	-7.3	-10.9	-12.0	-12.3	-12.8	-9.8	-7.4	-8.7
-5.5	-5.1	-5.0	-4.1	-4.8	-5.1	-6.6	-6.0	-6.4	-7.1	-3.9	-3.6	-4.4	-3.8	-4.2	-4.6	-5.6	-5.5	-6.2	-7.6	-5.8	-3.7	-6.5	-8.3	-9.0	-8.0	-6.5	-3.1	-5.4	-7.8	-8.0	-6.5	-6.7	-2.7	-2.3	-5.1
-5.1	-5.3	-5.2	-6.8	-8.0	-7.1	-6.9	-6.1	-4.9	-5.0	-3.2	-5.3	-3.2	-2.6	-3.0	-4.9	-5.8	-5.4	-5.1	-3.0	-5.1	-4.8	-5.7	-5.5	-4.8	-7.8	-7.2	-5.1	-3.3	-4.4	-5.8	-5.9	-3.8	-2.8	-4.0	-5.1
-4.7	-7.3	-7.3	-7.6	-8.3	-8.2	-10.0	-11.6	-11.8	-10.4	-6.1	-8.3	-8.7	-8.9	-7.7	-11.2	-12.2	-11.7	-12.0	-7.2	-9.3	-8.3	-4.7	-5.2	-6.2	-6.8	-7.5	-9.9	-9.2	-9.5	-9.3	-9.9	-8.7	-8.8	-6.2	-4.3
-3.5	-7.4	-8.0	-6.1	-6.4	-3.2	-5.0	-9.3	-8.7	-12.1	-12.1	-8.9	-7.7	-6.2	-7.7	-8.1	-8.3	-9.2	-11.0	-7.9	-8.1	-9.8	-10.1	-8.3	-9.9	-12.4	-9.5	-8.5	-10.1	-10.0	-7.1	-8.7	-10.3	-10.5	-9.7	-7.4
-5.9	-3.0	-1.5	-2.9	-4.6	-3.0	-1.7	-4.8	-4.5	-5.4	-6.4	-6.4	-6.2	-8.0	-5.5	-3.9	-4.7	-6.0	-5.8	-3.9	-4.0	-4.8	-4.9	-5.1	-5.9	-6.7	-5.9	-5.7	-6.7	-7.1	-5.7	-5.9	-6.2	-6.8	-5.5	-5.4
-1.0	-1.9	-2.5	-2.0	-1.7	-3.0	-1.3	-.7	-.7	.1	-.2	-2.4	-2.9	-2.4	-4.1	-3.1	-1.2	-.7	.5	-.6	-.6	-2.7	-2.1	-.3	-2.1	-.7	-.3	-1.1	-.9	-1.3	-2.1	-2.3	-.9	-1.8	-1.7	-.8
.8	-.1	.0	.5	-.1	.3	.7	.7	1.0	1.2	1.3	.9	1.0	.6	.0	1.3	1.3	1.7	2.4	.8	1.8	1.0	.4	1.0	.2	1.2	1.7	1.4	2.1	2.2	.9	1.0	1.2	-.1	-.1	.3
2.6	2.4	2.7	2.6	2.9	3.1	2.3	2.3	3.2	3.6	3.1	3.8	2.9	2.8	3.4	3.3	2.9	3.1	4.2	3.6	2.9	2.5	4.0	6.1	4.5	3.6	4.8	6.1	6.4	5.2	5.1	6.0	4.2	2.8	2.3	2.4
6.5	6.7	6.9	7.4	9.0	9.8	9.4	8.3	9.8	10.0	8.4	8.5	6.9	6.9	7.2	9.2	11.3	16.0	19.2	21.6	23.3	26.3	29.4	26.5	18.9	18.7	24.0	27.9	27.5	27.5	27.0	25.2	22.8	18.6	10.1	6.8
14.2	13.2	13.1	14.0	14.5	15.2	17.5	21.3	22.3	17.8	14.9	13.4	13.7	14.5	17.6	21.2	24.2	26.6	28.1	29.1	29.3	31.2	35.0	37.1	37.1	37.1	36.6	35.7	34.1	32.7	30.1	27.3	24.7	21.2	16.1	14.6

Figure 31. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2002
Channel: HIRS11 (500 - 700 hPa)
NOAA15, using all observations

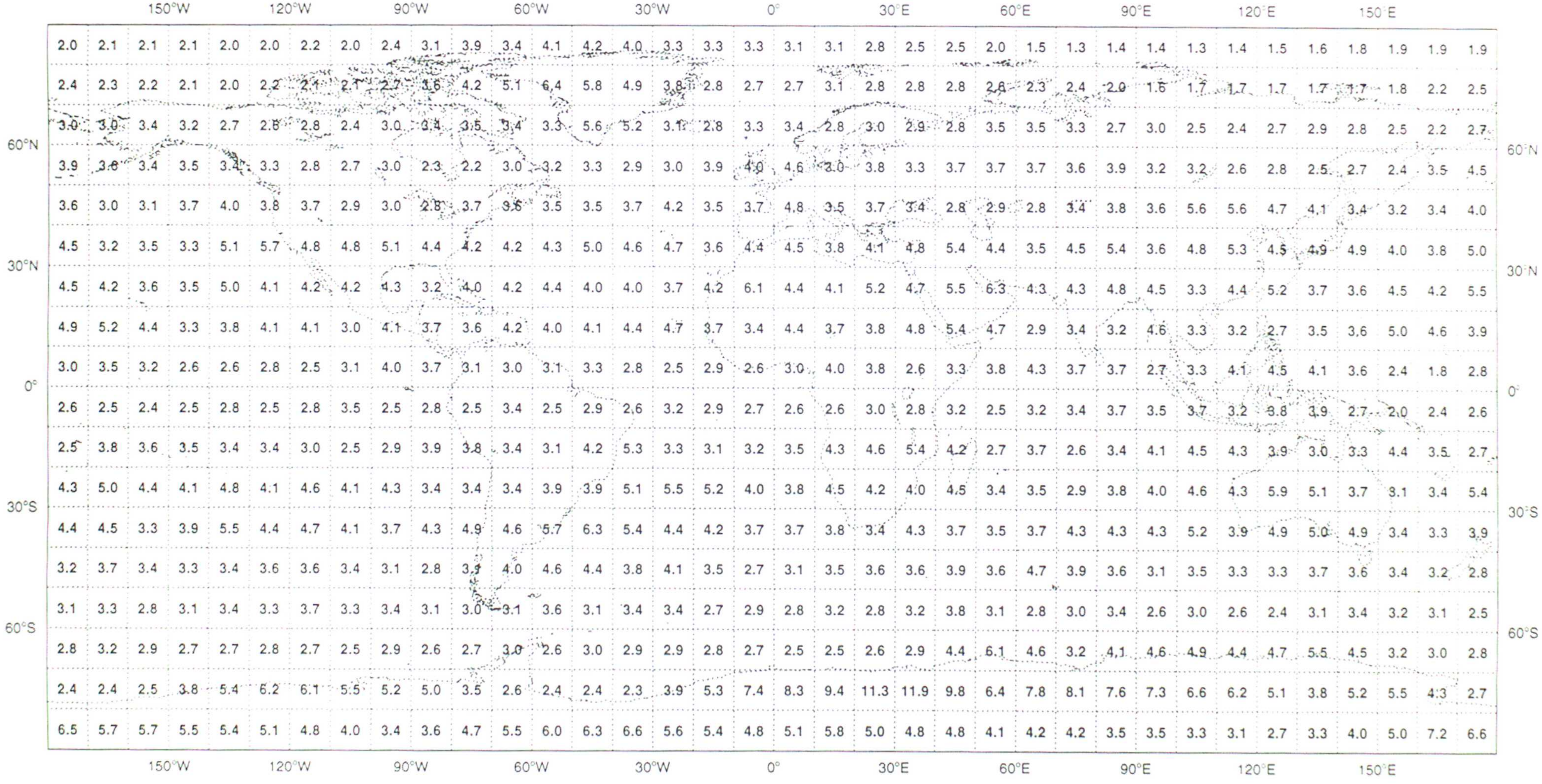
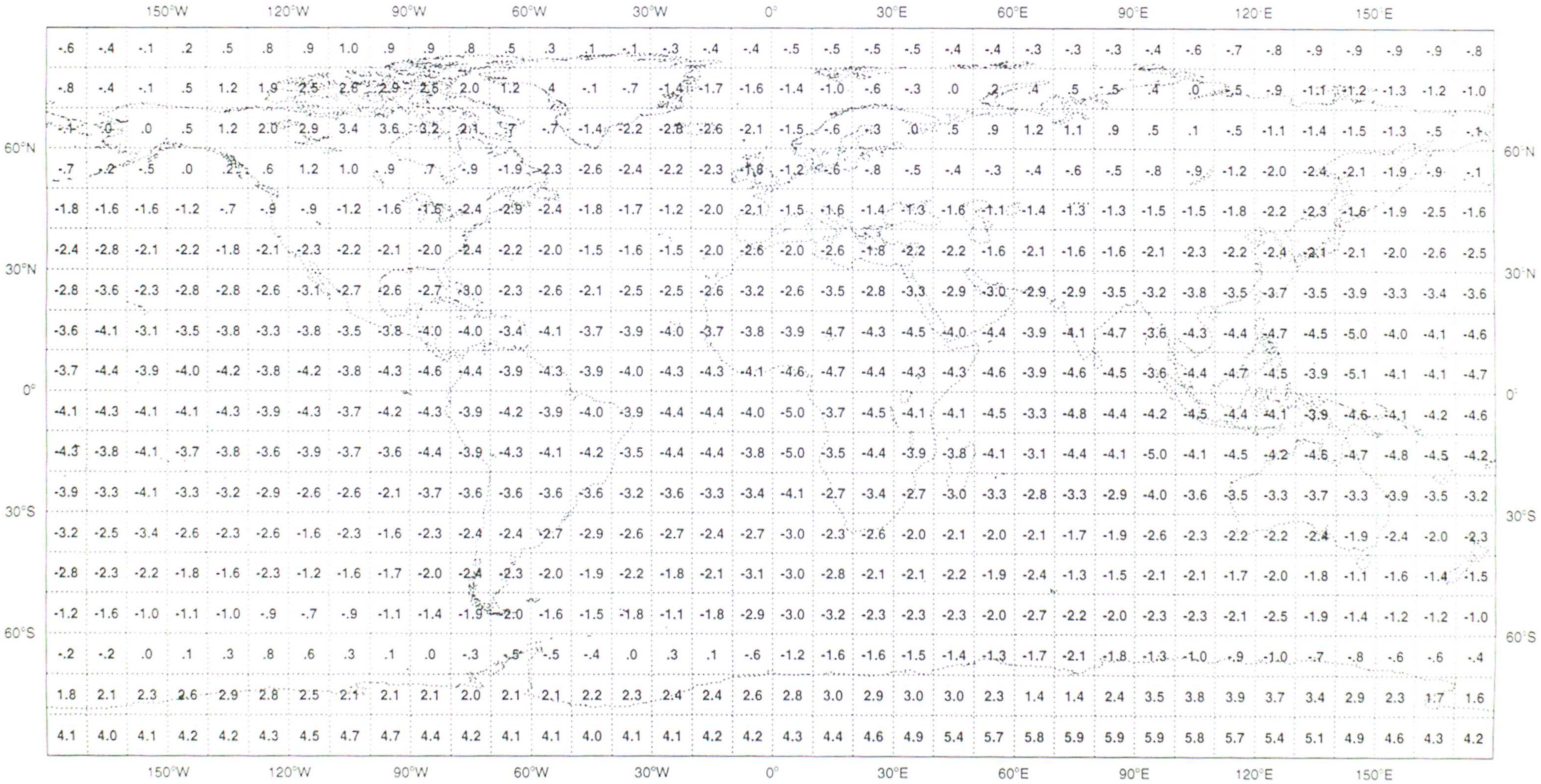
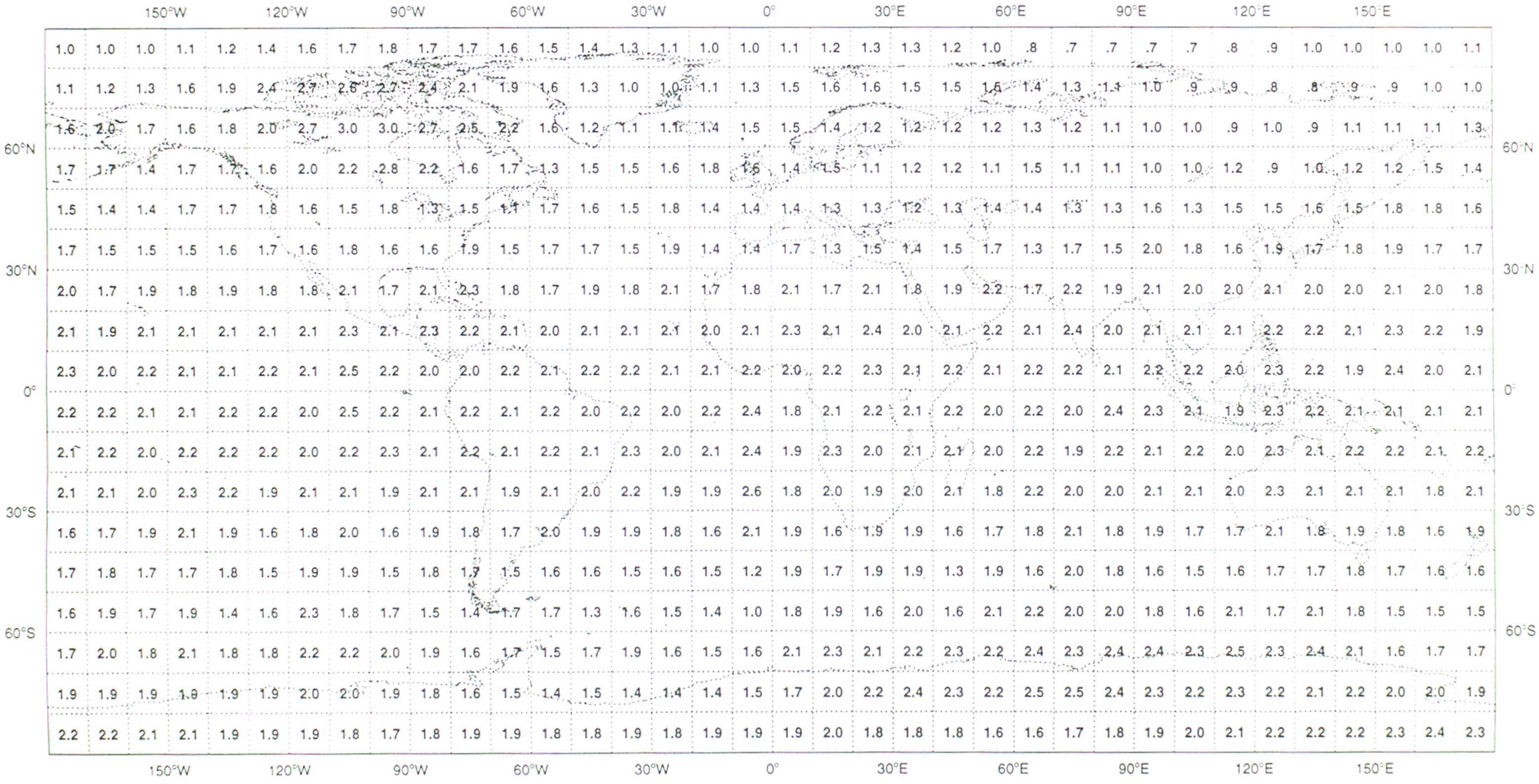

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
2.0 2.1 2.1 2.1 2.0 2.0 2.2 2.0 2.4 3.1 3.9 3.4 4.1 4.2 4.0 3.3 3.3 3.3 3.1 3.1 2.8 2.5 2.5 2.0 1.5 1.3 1.4 1.4 1.3 1.4 1.5 1.6 1.8 1.9 1.9 1.9
2.4 2.3 2.2 2.1 2.0 2.2 2.1 2.1 2.7 3.6 4.2 5.1 6.4 5.8 4.9 3.8 2.8 2.7 2.7 3.1 2.8 2.8 2.8 2.6 2.3 2.4 2.0 1.6 1.7 1.7 1.7 1.7 1.7 1.8 2.2 2.5
3.0 3.0 3.4 3.2 2.7 2.8 2.8 2.4 3.0 3.4 3.5 3.4 3.3 5.6 5.2 3.1 2.8 3.3 3.4 2.8 3.0 2.9 2.8 3.5 3.5 3.3 2.7 3.0 2.5 2.4 2.7 2.9 2.8 2.5 2.2 2.7
3.9 3.6 3.4 3.5 3.4 3.3 2.8 2.7 3.0 2.3 2.2 3.0 3.2 3.3 2.9 3.0 3.9 4.0 4.6 3.0 3.8 3.3 3.7 3.7 3.7 3.6 3.9 3.2 3.2 2.6 2.8 2.5 2.7 2.4 3.5 4.5
3.6 3.0 3.1 3.7 4.0 3.8 3.7 2.9 3.0 2.8 3.7 3.6 3.5 3.5 3.7 4.2 3.5 3.7 4.8 3.5 3.7 3.4 2.8 2.9 2.8 3.4 3.8 3.6 5.6 5.6 4.7 4.1 3.4 3.2 3.4 4.0
4.5 3.2 3.5 3.3 5.1 5.7 4.8 4.8 5.1 4.4 4.2 4.2 4.3 5.0 4.6 4.7 3.6 4.4 4.5 3.8 4.1 4.8 5.4 4.4 3.5 4.5 5.4 3.6 4.8 5.3 4.5 4.9 4.9 4.0 3.8 5.0
4.5 4.2 3.6 3.5 5.0 4.1 4.2 4.2 4.3 3.2 4.0 4.2 4.4 4.0 4.0 3.7 4.2 6.1 4.4 4.1 5.2 4.7 5.5 6.3 4.3 4.3 4.8 4.5 3.3 4.4 5.2 3.7 3.6 4.5 4.2 5.5
4.9 5.2 4.4 3.3 3.8 4.1 4.1 3.0 4.1 3.7 3.6 4.2 4.0 4.1 4.4 4.7 3.7 3.4 4.4 3.7 3.8 4.8 5.4 4.7 2.9 3.4 3.2 4.6 3.3 3.2 2.7 3.5 3.6 5.0 4.6 3.9
3.0 3.5 3.2 2.6 2.6 2.8 2.5 3.1 4.0 3.7 3.1 3.0 3.1 3.3 2.8 2.5 2.9 2.6 3.0 4.0 3.8 2.6 3.3 3.8 4.3 3.7 3.7 2.7 3.3 4.1 4.5 4.1 3.6 2.4 1.8 2.8
2.6 2.5 2.4 2.5 2.8 2.5 2.8 3.5 2.5 2.8 2.5 3.4 2.5 2.9 2.6 3.2 2.9 2.7 2.6 2.6 3.0 2.8 3.2 2.5 3.2 3.4 3.7 3.5 3.7 3.2 3.8 3.9 2.7 2.0 2.4 2.6
2.5 3.8 3.6 3.5 3.4 3.4 3.0 2.5 2.9 3.9 3.8 3.4 3.1 4.2 5.3 3.3 3.1 3.2 3.5 4.3 4.6 5.4 4.2 2.7 3.7 2.6 3.4 4.1 4.5 4.3 3.9 3.0 3.3 4.4 3.5 2.7
4.3 5.0 4.4 4.1 4.8 4.1 4.6 4.1 4.3 3.4 3.4 3.4 3.9 3.9 5.1 5.5 5.2 4.0 3.8 4.5 4.2 4.0 4.5 3.4 3.5 2.9 3.8 4.0 4.6 4.3 5.9 5.1 3.7 3.1 3.4 5.4
4.4 4.5 3.3 3.9 5.5 4.4 4.7 4.1 3.7 4.3 4.9 4.6 5.7 6.3 5.4 4.4 4.2 3.7 3.7 3.8 3.4 4.3 3.7 3.5 3.7 4.3 4.3 4.3 5.2 3.9 4.9 5.0 4.9 3.4 3.3 3.9
3.2 3.7 3.4 3.3 3.4 3.6 3.6 3.4 3.1 2.8 3.1 4.0 4.6 4.4 3.8 4.1 3.5 2.7 3.1 3.5 3.6 3.6 3.9 3.6 4.7 3.9 3.6 3.1 3.5 3.3 3.3 3.7 3.6 3.4 3.2 2.8
3.1 3.3 2.8 3.1 3.4 3.3 3.7 3.3 3.4 3.1 3.0 3.1 3.6 3.1 3.4 3.4 2.7 2.9 2.8 3.2 2.8 3.2 3.8 3.1 2.8 3.0 3.4 2.6 3.0 2.6 2.4 3.1 3.4 3.2 3.1 2.5
2.8 3.2 2.9 2.7 2.7 2.8 2.7 2.5 2.9 2.6 2.7 3.0 2.6 3.0 2.9 2.9 2.8 2.7 2.5 2.5 2.6 2.9 4.4 6.1 4.6 3.2 4.1 4.6 4.9 4.4 4.7 5.5 4.5 3.2 3.0 2.8
2.4 2.4 2.5 3.8 5.4 6.2 6.1 5.5 5.2 5.0 3.5 2.6 2.4 2.4 2.3 3.9 5.3 7.4 8.3 9.4 11.3 11.9 9.8 6.4 7.8 8.1 7.6 7.3 6.6 6.2 5.1 3.8 5.2 5.5 4.3 2.7
6.5 5.7 5.7 5.5 5.4 5.1 4.8 4.0 3.4 3.6 4.7 5.5 6.0 6.3 6.6 5.6 5.4 4.8 5.1 5.8 5.0 4.8 4.8 4.1 4.2 4.2 3.5 3.5 3.3 3.1 2.7 3.3 4.0 5.0 7.2 6.6

Figure 32. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2002
Channel: HIRS4 (400 hPa)
NOAA15, using all observations



-.6	-.4	-.1	.2	.5	.8	.9	1.0	.9	.9	.8	.5	.3	.1	-.1	-.3	-.4	-.4	-.5	-.5	-.5	-.5	-.4	-.4	-.3	-.3	-.3	-.4	-.6	-.7	-.8	-.9	-.9	-.9	-.9	-.8
-.8	-.4	-.1	.5	1.2	1.9	2.5	2.8	2.9	2.6	2.0	1.2	.4	-.1	-.7	-1.4	-1.7	-1.6	-1.4	-1.0	-.6	-.3	.0	.2	.4	.5	.5	.4	.0	-.5	-.9	-1.1	-1.2	-1.3	-1.2	-1.0
-.1	.0	.0	.5	1.2	2.0	2.9	3.4	3.6	3.2	2.1	.7	-.7	-1.4	-2.2	-2.8	-2.6	-2.1	-1.5	-.6	-.3	.0	.5	.9	1.2	1.1	.9	.5	.1	-.5	-1.1	-1.4	-1.5	-1.3	-.5	-.1
-.7	.2	-.5	.0	.2	.6	1.2	1.0	.9	.7	-.9	-1.9	-2.3	-2.6	-2.4	-2.2	-2.3	-1.8	-1.2	-.6	-.8	-.5	-.4	-.3	-.4	-.6	-.5	-.8	-.9	-1.2	-2.0	-2.4	-2.1	-1.9	-.9	-.1
-1.8	-1.6	-1.6	-1.2	-.7	-.9	-.9	-1.2	-1.6	-1.5	-2.4	-2.9	-2.4	-1.8	-1.7	-1.2	-2.0	-2.1	-1.5	-1.6	-1.4	-1.3	-1.6	-1.1	-1.4	-1.3	-1.3	-1.5	-1.5	-1.8	-2.2	-2.3	-1.6	-1.9	-2.5	-1.6
-2.4	-2.8	-2.1	-2.2	-1.8	-2.1	-2.3	-2.2	-2.1	-2.0	-2.4	-2.2	-2.0	-1.5	-1.6	-1.5	-2.0	-2.6	-2.0	-2.6	-1.8	-2.2	-2.2	-1.6	-2.1	-1.6	-1.6	-2.1	-2.3	-2.2	-2.4	-2.1	-2.1	-2.0	-2.6	-2.5
-2.8	-3.6	-2.3	-2.8	-2.8	-2.6	-3.1	-2.7	-2.6	-2.7	-3.0	-2.3	-2.6	-2.1	-2.5	-2.5	-2.6	-3.2	-2.6	-3.5	-2.8	-3.3	-2.9	-3.0	-2.9	-2.9	-3.5	-3.2	-3.8	-3.5	-3.7	-3.5	-3.9	-3.3	-3.4	-3.6
-3.6	-4.1	-3.1	-3.5	-3.8	-3.3	-3.8	-3.5	-3.8	-4.0	-4.0	-3.4	-4.1	-3.7	-3.9	-4.0	-3.7	-3.8	-3.9	-4.7	-4.3	-4.5	-4.0	-4.4	-3.9	-4.1	-4.7	-3.6	-4.3	-4.4	-4.7	-4.5	-5.0	-4.0	-4.1	-4.6
-3.7	-4.4	-3.9	-4.0	-4.2	-3.8	-4.2	-3.8	-4.3	-4.6	-4.4	-3.9	-4.3	-3.9	-4.0	-4.3	-4.3	-4.1	-4.6	-4.7	-4.4	-4.3	-4.3	-4.6	-3.9	-4.6	-4.5	-3.6	-4.4	-4.7	-4.5	-3.9	-5.1	-4.1	-4.1	-4.7
-4.1	-4.3	-4.1	-4.1	-4.3	-3.9	-4.3	-3.7	-4.2	-4.3	-3.9	-4.2	-3.9	-4.0	-3.9	-4.4	-4.4	-4.0	-5.0	-3.7	-4.5	-4.1	-4.1	-4.5	-3.3	-4.8	-4.4	-4.2	-4.5	-4.4	-4.1	-3.9	-4.6	-4.1	-4.2	-4.6
-4.3	-3.8	-4.1	-3.7	-3.8	-3.6	-3.9	-3.7	-3.6	-4.4	-3.9	-4.3	-4.1	-4.2	-3.5	-4.4	-4.4	-3.8	-5.0	-3.5	-4.4	-3.9	-3.8	-4.1	-3.1	-4.4	-4.1	-5.0	-4.1	-4.5	-4.2	-4.6	-4.7	-4.8	-4.5	-4.2
-3.9	-3.3	-4.1	-3.3	-3.2	-2.9	-2.6	-2.6	-2.1	-3.7	-3.6	-3.6	-3.6	-3.6	-3.2	-3.6	-3.3	-3.4	-4.1	-2.7	-3.4	-2.7	-3.0	-3.3	-2.8	-3.3	-2.9	-4.0	-3.6	-3.5	-3.3	-3.7	-3.3	-3.9	-3.5	-3.2
-3.2	-2.5	-3.4	-2.6	-2.3	-2.6	-1.6	-2.3	-1.6	-2.3	-2.4	-2.4	-2.7	-2.9	-2.6	-2.7	-2.4	-2.7	-3.0	-2.3	-2.6	-2.0	-2.1	-2.0	-2.1	-1.7	-1.9	-2.6	-2.3	-2.2	-2.2	-2.4	-1.9	-2.4	-2.0	-2.3
-2.8	-2.3	-2.2	-1.8	-1.6	-2.3	-1.2	-1.6	-1.7	-2.0	-2.4	-2.3	-2.0	-1.9	-2.2	-1.8	-2.1	-3.1	-3.0	-2.8	-2.1	-2.1	-2.2	-1.9	-2.4	-1.3	-1.5	-2.1	-2.1	-1.7	-2.0	-1.8	-1.1	-1.6	-1.4	-1.5
-1.2	-1.6	-1.0	-1.1	-1.0	-.9	-.7	-.9	-1.1	-1.4	-1.9	-2.0	-1.6	-1.5	-1.8	-1.1	-1.8	-2.9	-3.0	-3.2	-2.3	-2.3	-2.3	-2.0	-2.7	-2.2	-2.0	-2.3	-2.3	-2.1	-2.5	-1.9	-1.4	-1.2	-1.2	-1.0
-.2	-.2	.0	.1	.3	.8	.6	.3	.1	.0	-.3	-.5	-.5	-.4	.0	.3	.1	-.6	-1.2	-1.6	-1.6	-1.5	-1.4	-1.3	-1.7	-2.1	-1.8	-1.3	-1.0	-.9	-1.0	-.7	-.8	-.6	-.6	-.4
1.8	2.1	2.3	2.6	2.9	2.8	2.5	2.1	2.1	2.1	2.0	2.1	2.1	2.2	2.3	2.4	2.4	2.6	2.8	3.0	2.9	3.0	3.0	2.3	1.4	1.4	2.4	3.5	3.8	3.9	3.7	3.4	2.9	2.3	1.7	1.6
4.1	4.0	4.1	4.2	4.2	4.3	4.5	4.7	4.7	4.4	4.2	4.1	4.1	4.0	4.1	4.1	4.2	4.2	4.3	4.4	4.6	4.9	5.4	5.7	5.8	5.9	5.9	5.9	5.8	5.7	5.4	5.1	4.9	4.6	4.3	4.2

Figure 33. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2002
Channel: HIRS4 (400 hPa)
NOAA15, using all observations



1.0	1.0	1.0	1.1	1.2	1.4	1.6	1.7	1.8	1.7	1.7	1.6	1.5	1.4	1.3	1.1	1.0	1.0	1.1	1.2	1.3	1.3	1.2	1.0	.8	.7	.7	.7	.7	.8	.9	1.0	1.0	1.0	1.0	1.1
1.1	1.2	1.3	1.6	1.9	2.4	2.7	2.6	2.7	2.4	2.1	1.9	1.6	1.3	1.0	1.0	1.1	1.3	1.5	1.6	1.6	1.5	1.5	1.6	1.4	1.3	1.1	1.0	.9	.9	.8	.8	.9	.9	1.0	1.0
1.6	2.0	1.7	1.6	1.8	2.0	2.7	3.0	3.0	2.7	2.5	2.2	1.6	1.2	1.1	1.1	1.4	1.5	1.5	1.4	1.2	1.2	1.2	1.2	1.3	1.2	1.1	1.0	1.0	.9	1.0	.9	1.1	1.1	1.1	1.3
1.7	1.7	1.4	1.7	1.7	1.6	2.0	2.2	2.8	2.2	1.6	1.7	1.3	1.5	1.5	1.6	1.8	1.6	1.4	1.5	1.1	1.2	1.2	1.1	1.5	1.1	1.1	1.0	1.0	1.2	.9	1.0	1.2	1.2	1.5	1.4
1.5	1.4	1.4	1.7	1.7	1.8	1.6	1.5	1.8	1.3	1.5	1.1	1.7	1.6	1.5	1.8	1.4	1.4	1.4	1.3	1.3	1.2	1.3	1.4	1.4	1.3	1.3	1.6	1.3	1.5	1.5	1.6	1.5	1.8	1.8	1.6
1.7	1.5	1.5	1.5	1.6	1.7	1.6	1.8	1.6	1.6	1.9	1.5	1.7	1.7	1.5	1.9	1.4	1.4	1.7	1.3	1.5	1.4	1.5	1.7	1.3	1.7	1.5	2.0	1.8	1.6	1.9	1.7	1.8	1.9	1.7	1.7
2.0	1.7	1.9	1.8	1.9	1.8	1.8	2.1	1.7	2.1	2.3	1.8	1.7	1.9	1.8	2.1	1.7	1.8	2.1	1.7	2.1	1.8	1.9	2.2	1.7	2.2	1.9	2.1	2.0	2.0	2.1	2.0	2.0	2.1	2.0	1.8
2.1	1.9	2.1	2.1	2.1	2.1	2.1	2.3	2.1	2.3	2.2	2.1	2.0	2.1	2.1	2.1	2.0	2.1	2.3	2.1	2.4	2.0	2.1	2.2	2.1	2.4	2.0	2.1	2.1	2.1	2.2	2.2	2.1	2.3	2.2	1.9
2.3	2.0	2.2	2.1	2.1	2.2	2.1	2.5	2.2	2.0	2.0	2.2	2.1	2.2	2.2	2.1	2.1	2.2	2.0	2.2	2.3	2.1	2.2	2.1	2.2	2.2	2.1	2.2	2.2	2.0	2.3	2.2	1.9	2.4	2.0	2.1
2.2	2.2	2.1	2.1	2.2	2.2	2.0	2.5	2.2	2.1	2.2	2.1	2.2	2.0	2.2	2.0	2.2	2.4	1.8	2.1	2.2	2.1	2.2	2.0	2.2	2.0	2.4	2.3	2.1	1.9	2.3	2.2	2.1	2.1	2.1	2.1
2.1	2.2	2.0	2.2	2.2	2.2	2.0	2.2	2.3	2.1	2.2	2.1	2.2	2.1	2.3	2.0	2.1	2.4	1.9	2.3	2.0	2.1	2.1	2.0	2.2	1.9	2.2	2.1	2.2	2.0	2.3	2.1	2.2	2.2	2.1	2.2
2.1	2.1	2.0	2.3	2.2	1.9	2.1	2.1	1.9	2.1	2.1	1.9	2.1	2.0	2.2	1.9	1.9	2.6	1.8	2.0	1.9	2.0	2.1	1.8	2.2	2.0	2.0	2.1	2.1	2.0	2.3	2.1	2.1	2.1	1.8	2.1
1.6	1.7	1.9	2.1	1.9	1.6	1.8	2.0	1.6	1.9	1.8	1.7	2.0	1.9	1.9	1.8	1.6	2.1	1.9	1.6	1.9	1.9	1.6	1.7	1.8	2.1	1.8	1.9	1.7	1.7	2.1	1.8	1.9	1.8	1.6	1.9
1.7	1.8	1.7	1.7	1.8	1.5	1.9	1.9	1.5	1.8	1.7	1.5	1.6	1.6	1.5	1.6	1.5	1.2	1.9	1.7	1.9	1.9	1.3	1.9	1.6	2.0	1.8	1.6	1.5	1.6	1.7	1.7	1.8	1.7	1.6	1.6
1.6	1.9	1.7	1.9	1.4	1.6	2.3	1.8	1.7	1.5	1.4	1.7	1.7	1.3	1.6	1.5	1.4	1.0	1.8	1.9	1.6	2.0	1.6	2.1	2.2	2.0	2.0	1.8	1.6	2.1	1.7	2.1	1.8	1.5	1.5	1.5
1.7	2.0	1.8	2.1	1.8	1.8	2.2	2.2	2.0	1.9	1.6	1.7	1.5	1.7	1.9	1.6	1.5	1.6	2.1	2.3	2.1	2.2	2.3	2.2	2.4	2.3	2.4	2.4	2.3	2.5	2.3	2.4	2.1	1.6	1.7	1.7
1.9	1.9	1.9	1.8	1.9	1.9	2.0	2.0	1.9	1.8	1.6	1.5	1.4	1.5	1.4	1.4	1.4	1.5	1.7	2.0	2.2	2.4	2.3	2.2	2.5	2.5	2.4	2.3	2.2	2.3	2.2	2.1	2.2	2.0	2.0	1.9
2.2	2.2	2.1	2.1	1.9	1.9	1.9	1.8	1.7	1.8	1.9	1.9	1.8	1.8	1.9	1.8	1.9	1.9	1.9	2.0	1.8	1.8	1.8	1.6	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.2	2.2	2.3	2.4	2.3

Figure 34. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2002
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations

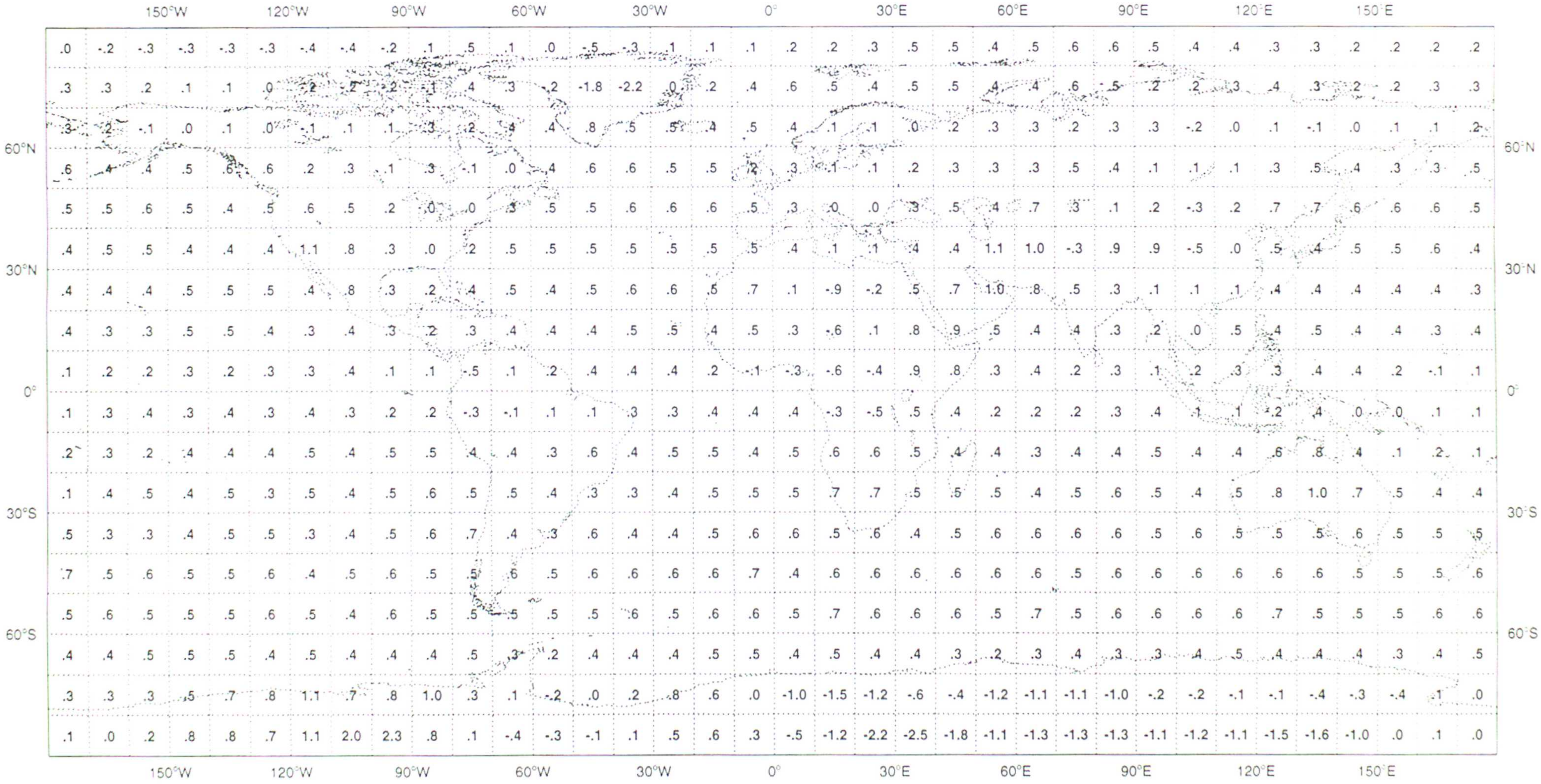

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
.0 -.2 -.3 -.3 -.3 -.3 -.4 -.4 -.2 .1 .5 .1 .0 -.5 -.3 .1 .1 .1 .2 .2 .3 .5 .5 .4 .5 .6 .6 .5 .4 .4 .3 .3 .2 .2 .2 .2
.3 .3 .2 .1 .1 .0 .2 .2 .2 .1 .4 .3 .2 -1.8 -2.2 .0 .2 .4 .6 .5 .4 .5 .5 .4 .4 .6 .5 .2 .2 .3 .4 .3 .2 .2 .3 .3
.3 .2 -.1 .0 .1 .0 -.1 .1 .1 .3 .2 .4 .4 .8 .5 .5 .4 .5 .4 .1 .1 .0 .2 .3 .3 .2 .3 .3 -.2 .0 .1 -.1 .0 .1 .1 .2
.6 .4 .4 .5 .6 .6 .2 .3 .1 .3 -.1 .0 .4 .6 .6 .5 .5 .2 .3 .1 .1 .2 .3 .3 .3 .5 .4 .1 .1 .1 .3 .5 .4 .3 .3 .5
.5 .5 .6 .5 .4 .5 .6 .5 .2 .0 .0 .3 .5 .5 .6 .6 .6 .5 .3 .0 .0 .3 .5 .4 .7 .3 .1 .2 -.3 .2 .7 .7 .6 .6 .6 .5
.4 .5 .5 .4 .4 .4 1.1 .8 .3 .0 .2 .5 .5 .5 .5 .5 .5 .5 .4 .1 .1 .4 .4 1.1 1.0 -.3 .9 .9 -.5 .0 .5 .4 .5 .5 .6 .4
.4 .4 .4 .5 .5 .5 .4 .8 .3 .2 .4 .5 .4 .5 .6 .6 .5 .7 .1 -.9 -.2 .5 .7 1.0 .8 .5 .3 .1 .1 .1 .4 .4 .4 .4 .4 .3
.4 .3 .3 .5 .5 .4 .3 .4 .3 .2 .3 .4 .4 .4 .5 .5 .4 .5 .3 -.6 .1 .8 .9 .5 .4 .4 .3 .2 .0 .5 .4 .5 .4 .4 .3 .4
.1 .2 .2 .3 .2 .3 .3 .4 .1 .1 -.5 .1 .2 .4 .4 .4 .2 -.1 -.3 -.6 -.4 .9 .8 .3 .4 .2 .3 .1 .2 .3 .3 .4 .4 .2 -.1 .1
.1 .3 .4 .3 .4 .3 .4 .3 .2 .2 -.3 -.1 .1 .1 .3 .3 .4 .4 .4 -.3 -.5 .5 .4 .2 .2 .2 .3 .4 .1 .1 .2 .4 .0 .0 .1 .1
.2 .3 .2 .4 .4 .4 .5 .4 .5 .5 .4 .4 .3 .6 .4 .5 .5 .4 .5 .6 .6 .5 .4 .4 .3 .4 .4 .5 .4 .4 .6 .8 .4 .1 .2 .1
.1 .4 .5 .4 .5 .3 .5 .4 .5 .6 .5 .5 .4 .3 .3 .4 .5 .5 .5 .7 .7 .5 .5 .5 .4 .5 .6 .5 .4 .5 .8 1.0 .7 .5 .4 .4
.5 .3 .3 .4 .5 .5 .3 .4 .5 .6 .7 .4 .3 .6 .4 .4 .5 .6 .6 .5 .6 .4 .5 .6 .6 .6 .6 .5 .6 .5 .5 .5 .6 .5 .5 .5
.7 .5 .6 .5 .5 .6 .4 .5 .6 .5 .5 .6 .5 .6 .6 .6 .6 .7 .4 .6 .6 .6 .6 .6 .6 .5 .6 .6 .6 .6 .6 .6 .5 .5 .5 .6
.5 .6 .5 .5 .5 .6 .5 .4 .6 .5 .5 .5 .5 .5 .6 .5 .6 .6 .5 .7 .6 .6 .6 .5 .7 .5 .6 .6 .6 .6 .7 .5 .5 .5 .6 .6
.4 .4 .5 .5 .5 .4 .5 .4 .4 .4 .5 .3 .2 .4 .4 .4 .5 .5 .4 .5 .4 .4 .3 .2 .3 .4 .3 .3 .4 .5 .4 .4 .4 .3 .4 .5
.3 .3 .3 .5 .7 .8 1.1 .7 .8 1.0 .3 .1 -.2 .0 .2 .8 .6 .0 -1.0 -1.5 -1.2 -.6 -.4 -1.2 -1.1 -1.1 -1.0 -.2 -.2 -.1 -.1 -.4 -.3 -.4 .1 .0
.1 .0 .2 .8 .8 .7 1.1 2.0 2.3 .8 .1 -.4 -.3 -.1 .1 .5 .6 .3 -.5 -1.2 -2.2 -2.5 -1.8 -1.1 -1.3 -1.3 -1.3 -1.1 -1.2 -1.1 -1.5 -1.6 -1.0 .0 .1 .0

Figure 35. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2002
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations

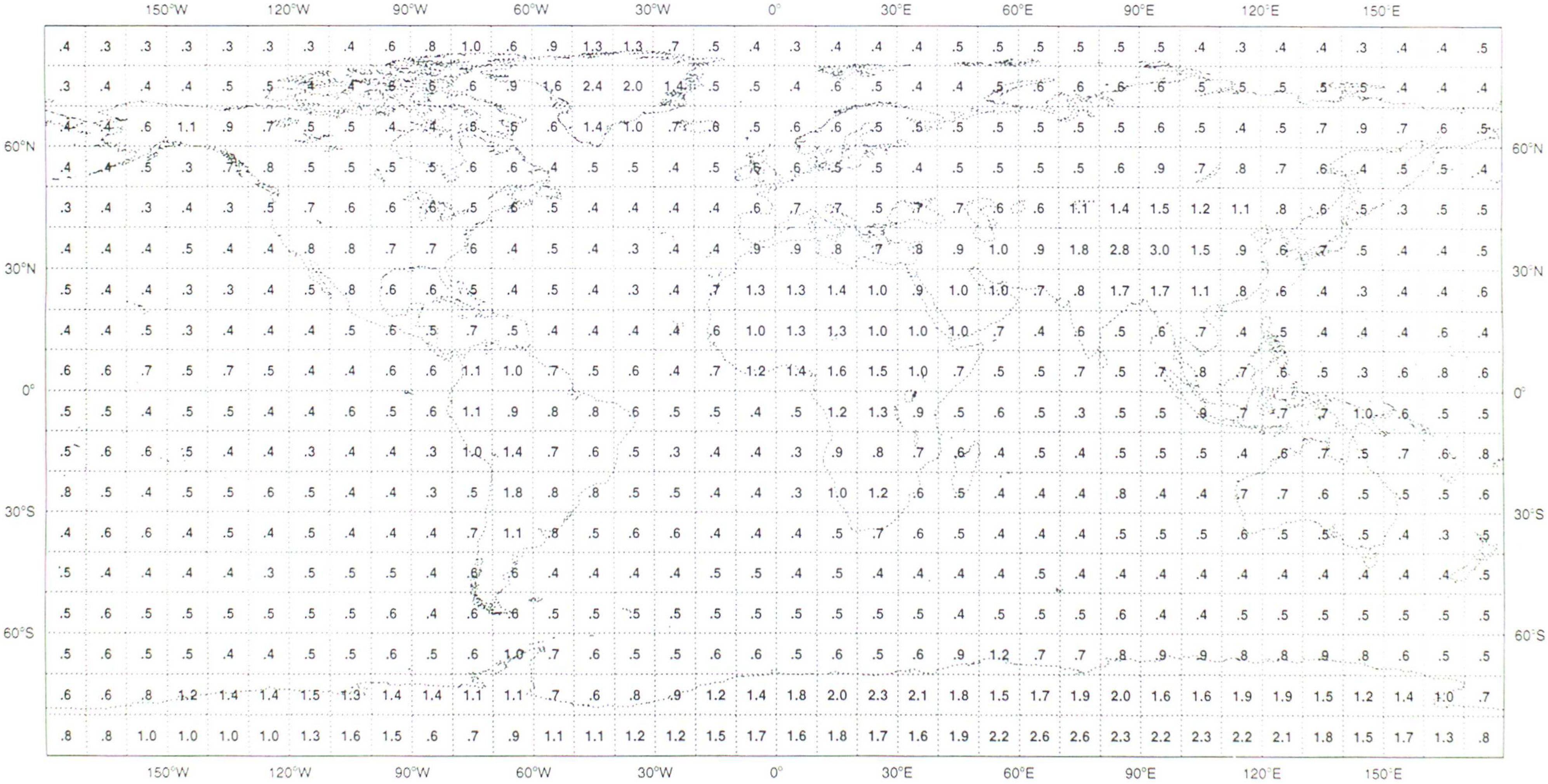

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
.4 .3 .3 .3 .3 .3 .3 .4 .6 .8 1.0 .6 .9 1.3 1.3 .7 .5 .4 .3 .4 .4 .4 .5 .5 .5 .5 .5 .5 .4 .3 .4 .4 .3 .4 .4 .5
.3 .4 .4 .4 .5 .5 .4 .4 .5 .6 .6 .9 1.6 2.4 2.0 1.4 .5 .5 .4 .6 .5 .4 .4 .5 .6 .6 .6 .6 .5 .5 .5 .5 .5 .4 .4 .4
.4 .4 .6 1.1 .9 .7 .5 .5 .4 .4 .8 .6 .6 1.4 1.0 .7 .8 .5 .6 .6 .5 .5 .5 .5 .5 .5 .5 .6 .5 .4 .5 .7 .9 .7 .6 .5
.4 .4 .5 .3 .7 .8 .5 .5 .5 .5 .6 .6 .4 .5 .5 .4 .5 .6 .6 .5 .5 .4 .5 .5 .5 .5 .6 .9 .7 .8 .7 .6 .4 .5 .5 .4
.3 .4 .3 .4 .3 .5 .7 .6 .6 .6 .5 .6 .5 .4 .4 .4 .4 .6 .7 .7 .5 .7 .7 .6 .6 1.1 1.4 1.5 1.2 1.1 .8 .6 .5 .3 .5 .5
.4 .4 .4 .5 .4 .4 .8 .8 .7 .7 .6 .4 .5 .4 .3 .4 .4 .9 .9 .8 .7 .8 .9 1.0 .9 1.8 2.8 3.0 1.5 .9 .6 .7 .5 .4 .4 .5
.5 .4 .4 .3 .3 .4 .5 .8 .6 .6 .5 .4 .5 .4 .3 .4 .7 1.3 1.3 1.4 1.0 .9 1.0 1.0 .7 .8 1.7 1.7 1.1 .8 .6 .4 .3 .4 .4 .6
.4 .4 .5 .3 .4 .4 .4 .5 .6 .5 .7 .5 .4 .4 .4 .4 .6 1.0 1.3 1.3 1.0 1.0 1.0 .7 .4 .6 .5 .6 .7 .4 .5 .4 .4 .4 .6 .4
.6 .6 .7 .5 .7 .5 .4 .4 .6 .6 1.1 1.0 .7 .5 .6 .4 .7 1.2 1.4 1.6 1.5 1.0 .7 .5 .5 .7 .5 .7 .8 .7 .6 .5 .3 .6 .8 .6
.5 .5 .4 .5 .5 .4 .4 .6 .5 .6 1.1 .9 .8 .8 .6 .5 .5 .4 .5 1.2 1.3 .9 .5 .6 .5 .3 .5 .5 .9 .7 .7 .7 1.0 .6 .5 .5
.5 .6 .6 .5 .4 .4 .3 .4 .4 .3 1.0 1.4 .7 .6 .5 .3 .4 .4 .3 .9 .8 .7 .6 .4 .5 .4 .5 .5 .5 .4 .6 .7 .5 .7 .6 .8
.8 .5 .4 .5 .5 .6 .5 .4 .4 .3 .5 1.8 .8 .8 .5 .5 .4 .4 .3 1.0 1.2 .6 .5 .4 .4 .4 .8 .4 .4 .7 .7 .6 .5 .5 .5 .6
.4 .6 .6 .4 .5 .4 .5 .4 .4 .4 .7 1.1 .8 .5 .6 .6 .4 .4 .4 .5 .7 .6 .5 .4 .4 .4 .5 .5 .5 .6 .5 .5 .5 .4 .3 .5
.5 .4 .4 .4 .4 .3 .5 .5 .5 .4 .6 .6 .4 .4 .4 .4 .5 .5 .4 .5 .4 .4 .4 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5
.5 .6 .5 .5 .5 .5 .5 .5 .6 .4 .6 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .6 .4 .4 .5 .5 .5 .5 .5 .5 .5
.5 .6 .5 .5 .4 .4 .5 .5 .6 .5 .6 1.0 .7 .6 .5 .5 .6 .6 .5 .6 .5 .6 .9 1.2 .7 .7 .8 .9 .9 .8 .8 .9 .8 .6 .5 .5
.6 .6 .8 1.2 1.4 1.4 1.5 1.3 1.4 1.4 1.1 1.1 .7 .6 .8 .9 1.2 1.4 1.8 2.0 2.3 2.1 1.8 1.5 1.7 1.9 2.0 1.6 1.6 1.9 1.9 1.5 1.2 1.4 1.0 .7
.8 .8 1.0 1.0 1.0 1.0 1.3 1.6 1.5 .6 .7 .9 1.1 1.1 1.2 1.2 1.5 1.7 1.6 1.8 1.7 1.6 1.9 2.2 2.6 2.6 2.3 2.2 2.3 2.2 2.1 1.8 1.5 1.7 1.3 .8
150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S

Figure 36. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2002
Channel: AMSUA-7 (300 hPa)
NOAA15, using all observations

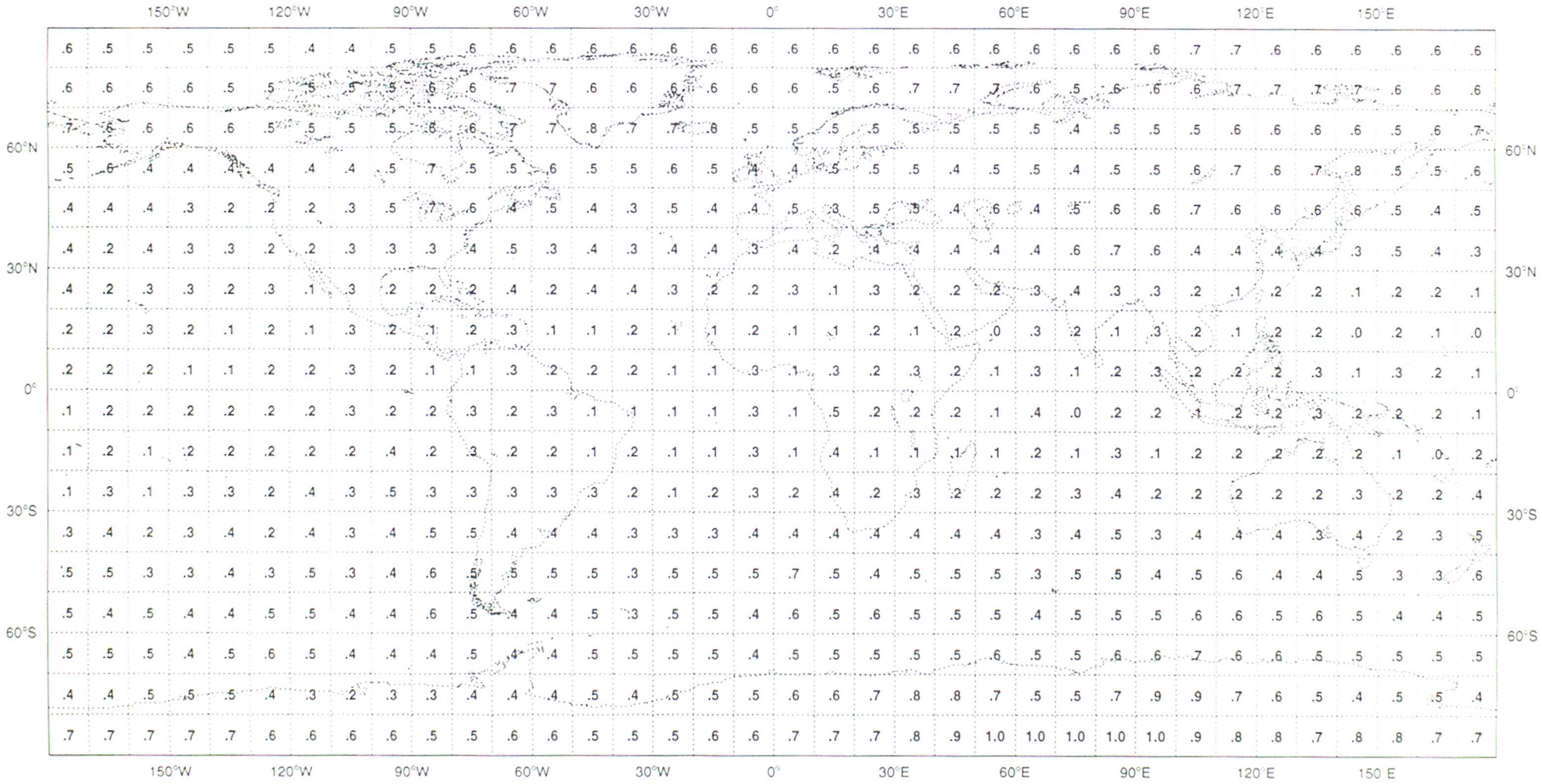

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 37. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2002
Channel: AMSUA-7 (300 hPa)
NOAA15, using all observations

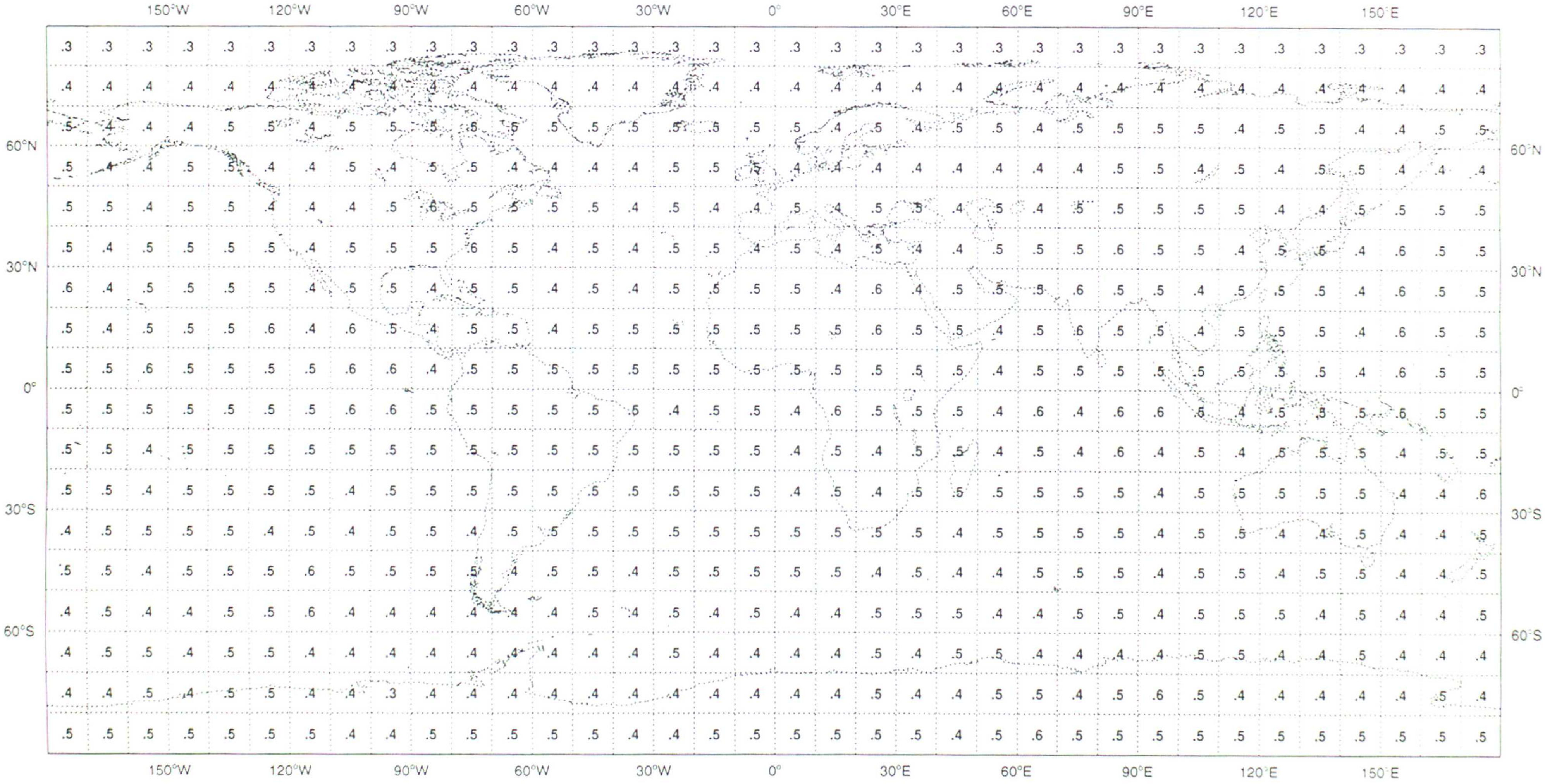

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 38. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2002
Channel: AMSUA-9 (100 hPa)
NOAA15, using all observations

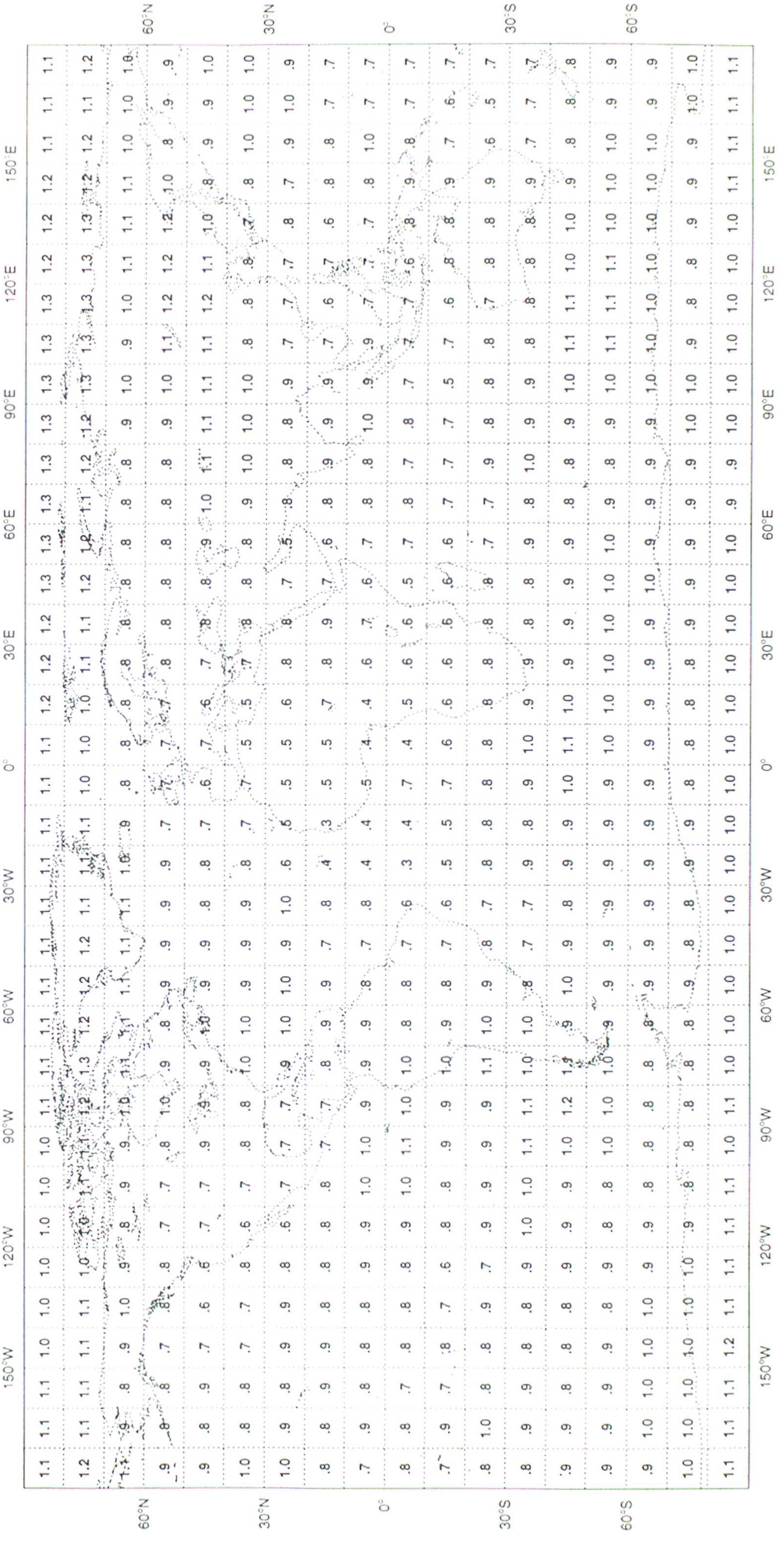
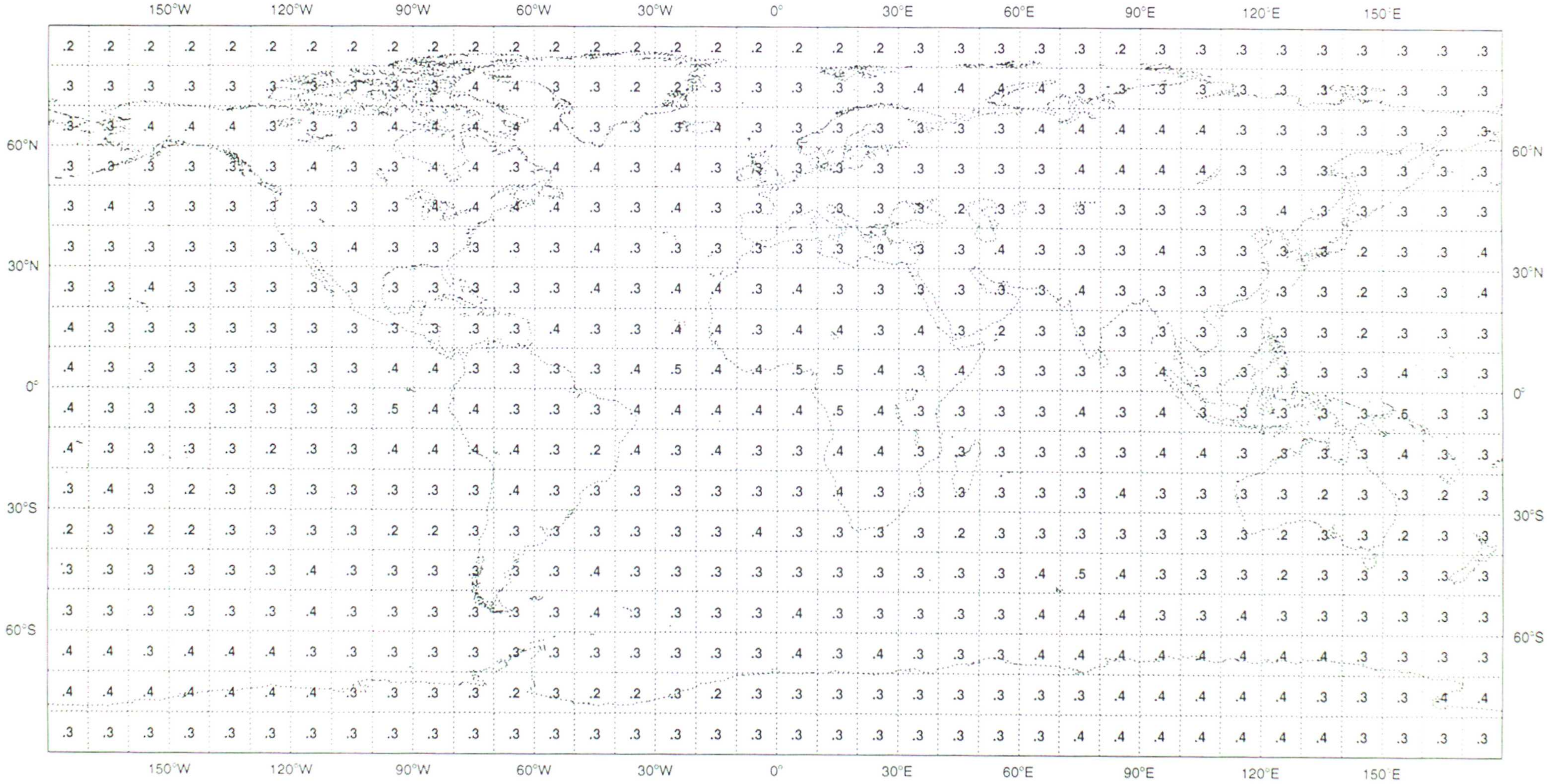

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 39. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2002
Channel: AMSUA-9 (100 hPa)
NOAA15, using all observations

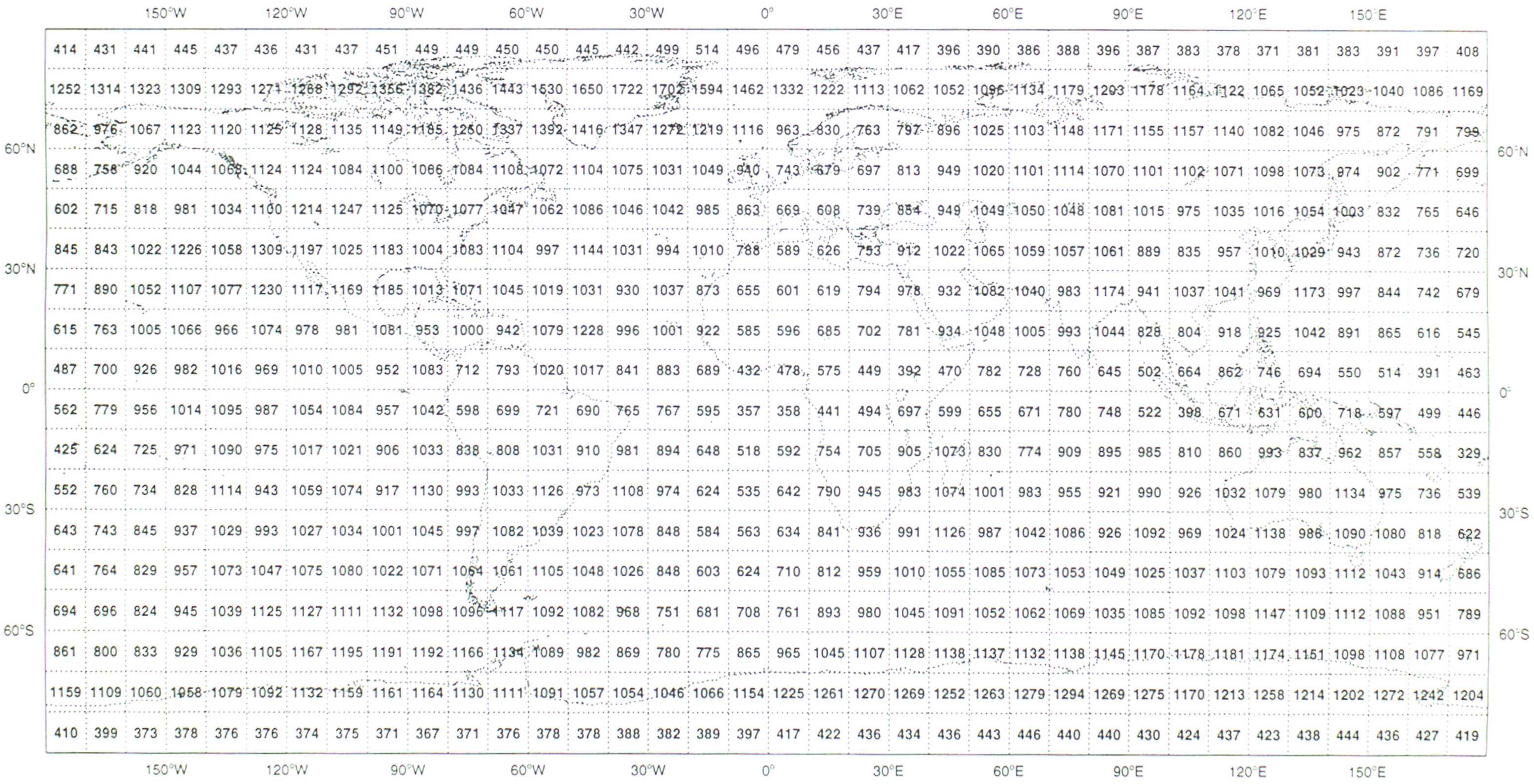


.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.3	.3	.3	.3	.3	.2	.3	.3	.3	.3	.3	.3	.3	.3	.3
.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.4	.3	.3	.2	.2	.3	.3	.3	.3	.3	.4	.4	.4	.4	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3
.3	.3	.4	.4	.4	.3	.3	.3	.4	.4	.4	.4	.4	.3	.3	.3	.4	.3	.3	.3	.3	.3	.3	.3	.4	.4	.4	.4	.4	.3	.3	.3	.3	.3	.3	.3
.3	.3	.3	.3	.3	.3	.4	.3	.3	.4	.4	.3	.4	.4	.3	.4	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.4	.4	.4	.3	.3	.3	.3	.3	.3	.3
.3	.4	.3	.3	.3	.3	.3	.3	.3	.4	.4	.4	.4	.3	.3	.4	.3	.3	.3	.3	.3	.3	.2	.3	.3	.3	.3	.3	.3	.3	.4	.3	.3	.3	.3	.3
.3	.3	.3	.3	.3	.3	.3	.4	.3	.3	.3	.3	.3	.4	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.3	.3	.3	.4	.3	.3	.3	.3	.2	.3	.3	.4
.3	.3	.4	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.3	.4	.4	.3	.4	.3	.3	.3	.3	.3	.3	.4	.3	.3	.3	.3	.3	.3	.2	.3	.3	.4
.4	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.3	.3	.4	.4	.3	.4	.4	.3	.4	.3	.2	.3	.3	.3	.3	.3	.3	.3	.3	.2	.3	.3	.3
.4	.3	.3	.3	.3	.3	.3	.3	.4	.4	.3	.3	.3	.3	.4	.5	.4	.4	.5	.5	.4	.3	.4	.3	.3	.3	.3	.4	.3	.3	.3	.3	.3	.4	.3	.3
.4	.3	.3	.3	.3	.3	.3	.3	.5	.4	.4	.3	.3	.3	.4	.4	.4	.4	.4	.5	.4	.3	.3	.3	.3	.3	.4	.3	.4	.3	.3	.3	.3	.3	.6	.3	.3
.4	.3	.3	.3	.3	.2	.3	.3	.4	.4	.4	.4	.3	.2	.4	.3	.4	.3	.3	.4	.4	.3	.3	.3	.3	.3	.3	.3	.4	.4	.3	.3	.3	.3	.4	.3	.3
.3	.4	.3	.2	.3	.3	.3	.3	.3	.3	.3	.4	.3	.3	.3	.3	.3	.3	.3	.4	.3	.3	.3	.3	.3	.3	.3	.4	.3	.3	.3	.3	.2	.3	.3	.2	.3
.2	.3	.2	.2	.3	.3	.3	.3	.2	.2	.3	.3	.3	.3	.3	.3	.3	.4	.3	.3	.3	.3	.2	.3	.3	.3	.3	.3	.3	.3	.2	.3	.3	.2	.3	.3
.3	.3	.3	.3	.3	.3	.4	.3	.3	.3	.3	.3	.3	.4	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.5	.4	.3	.3	.3	.2	.3	.3	.3	.3	.3
.3	.3	.3	.3	.3	.3	.4	.3	.3	.3	.3	.3	.3	.4	.3	.3	.3	.3	.4	.3	.3	.3	.3	.3	.4	.4	.4	.3	.3	.4	.3	.3	.3	.3	.3	.3
.4	.4	.3	.4	.4	.4	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.3	.4	.3	.3	.3	.4	.4	.4	.4	.4	.4	.4	.4	.3	.3	.3	.3
.4	.4	.4	.4	.4	.4	.4	.3	.3	.3	.3	.2	.3	.2	.2	.3	.2	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.4	.4	.4	.4	.3	.3	.3	.4	.4
.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.4	.4	.4	.4	.4	.4	.3	.3	.3	.3

Figure 40. ATOVS mean daily count. APRIL 2002

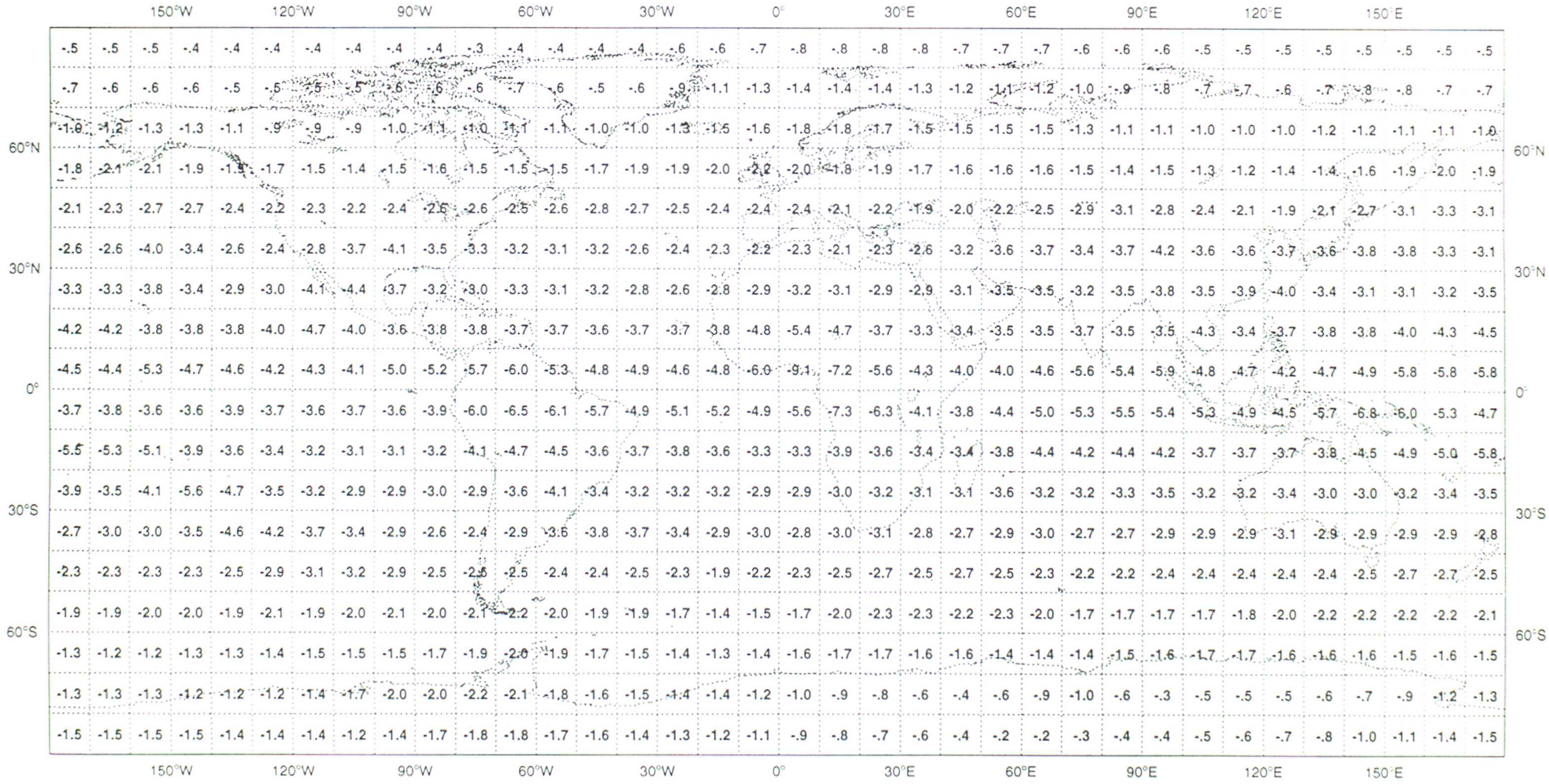
NOAA16, using all observations

Global average number of observations in 24 hours = 586525



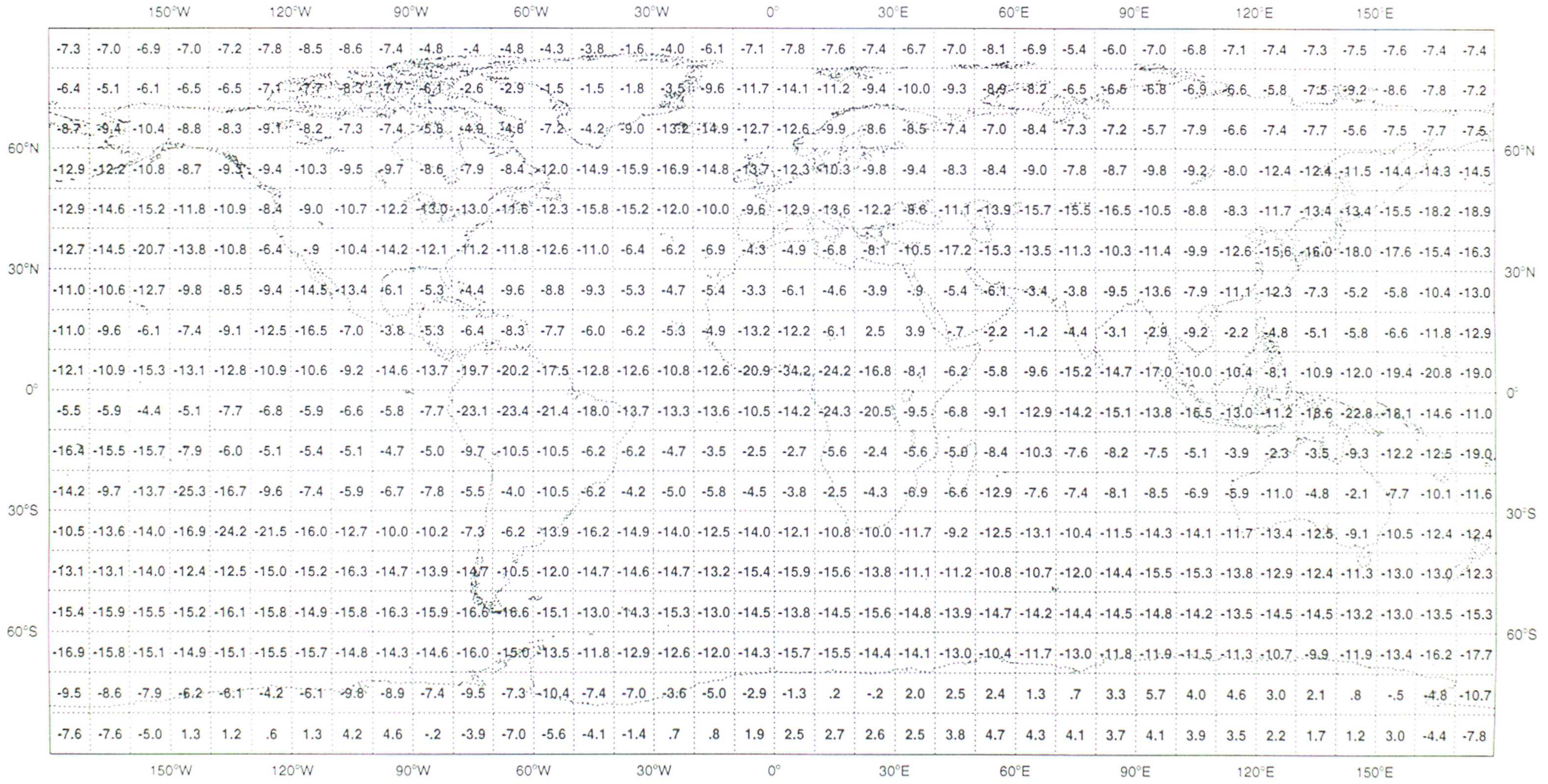
414	431	441	445	437	436	431	437	451	449	449	450	450	445	442	499	514	496	479	456	437	417	396	390	386	388	396	387	383	378	371	381	383	391	397	408
1252	1314	1323	1309	1293	1271	1268	1292	1356	1382	1436	1443	1530	1650	1722	1702	1594	1462	1332	1222	1113	1062	1052	1096	1134	1179	1203	1178	1164	1122	1065	1052	1023	1040	1086	1169
862	976	1067	1123	1120	1125	1128	1135	1149	1185	1260	1337	1392	1416	1347	1272	1219	1116	963	830	763	797	896	1025	1103	1148	1171	1155	1157	1140	1082	1046	975	872	791	799
688	758	920	1044	1068	1124	1124	1084	1100	1066	1084	1108	1072	1104	1075	1031	1049	940	743	679	697	813	949	1020	1101	1114	1070	1101	1102	1071	1098	1073	974	902	771	699
602	715	818	981	1034	1100	1214	1247	1125	1070	1077	1047	1062	1086	1046	1042	985	863	669	608	739	854	949	1049	1050	1048	1081	1015	975	1035	1016	1054	1003	832	765	646
845	843	1022	1226	1058	1309	1197	1025	1183	1004	1083	1104	997	1144	1031	994	1010	788	589	626	753	912	1022	1065	1059	1057	1061	889	835	957	1010	1029	943	872	736	720
771	890	1052	1107	1077	1230	1117	1169	1185	1013	1071	1045	1019	1031	930	1037	873	655	601	619	794	978	932	1082	1040	983	1174	941	1037	1041	969	1173	997	844	742	679
615	763	1005	1066	966	1074	978	981	1081	953	1000	942	1079	1228	996	1001	922	585	596	685	702	781	934	1048	1005	993	1044	828	804	918	925	1042	891	865	616	545
487	700	926	982	1016	969	1010	1005	952	1083	712	793	1020	1017	841	883	689	432	478	575	449	392	470	782	728	760	645	502	664	862	746	694	550	514	391	463
562	779	956	1014	1095	987	1054	1084	957	1042	598	699	721	690	765	767	595	357	358	441	494	697	599	655	671	780	748	522	398	671	631	600	718	597	499	446
425	624	725	971	1090	975	1017	1021	906	1033	838	808	1031	910	981	894	648	518	592	754	705	905	1073	830	774	909	895	985	810	860	993	837	962	857	558	329
552	760	734	828	1114	943	1059	1074	917	1130	993	1033	1126	973	1108	974	624	535	642	790	945	983	1074	1001	983	955	921	990	926	1032	1079	980	1134	975	736	539
643	743	845	937	1029	993	1027	1034	1001	1045	997	1082	1039	1023	1078	848	584	563	634	841	936	991	1126	987	1042	1086	926	1092	969	1024	1138	986	1090	1080	818	622
641	764	829	957	1073	1047	1075	1080	1022	1071	1064	1061	1105	1048	1026	848	603	624	710	812	959	1010	1055	1085	1073	1053	1049	1025	1037	1103	1079	1093	1112	1043	914	686
694	696	824	945	1039	1125	1127	1111	1132	1098	1096	1117	1092	1082	968	751	681	708	761	893	980	1045	1091	1052	1062	1069	1035	1085	1092	1098	1147	1109	1112	1088	951	789
861	800	833	929	1036	1105	1167	1195	1191	1192	1166	1134	1089	982	869	780	775	865	965	1045	1107	1128	1138	1137	1132	1138	1145	1170	1178	1181	1174	1151	1098	1108	1077	971
1159	1109	1060	1058	1079	1092	1132	1159	1161	1164	1130	1111	1091	1057	1054	1046	1066	1154	1225	1261	1270	1269	1252	1263	1279	1294	1269	1275	1170	1213	1258	1214	1202	1272	1242	1204
410	399	373	378	376	376	374	375	371	367	371	376	378	378	388	382	389	397	417	422	436	434	436	443	446	440	440	430	424	437	423	438	444	436	427	419

Figure 41. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2002
Channel: HIRS8 (Surface)
NOAA16, using all observations



-.5	-.5	-.5	-.4	-.4	-.4	-.4	-.4	-.4	-.4	-.3	-.4	-.4	-.4	-.4	-.6	-.6	-.7	-.8	-.8	-.8	-.8	-.7	-.7	-.7	-.6	-.6	-.6	-.5	-.5	-.5	-.5	-.5	-.5	-.5	-.5
-.7	-.6	-.6	-.6	-.5	-.5	-.5	-.5	-.6	-.6	-.6	-.7	-.6	-.5	-.6	-.9	-1.1	-1.3	-1.4	-1.4	-1.4	-1.3	-1.2	-1.1	-1.2	-1.0	-.9	-.8	-.7	-.7	-.6	-.7	-.8	-.8	-.7	-.7
-1.0	-1.2	-1.3	-1.3	-1.1	-.9	-.9	-.9	-1.0	-1.1	-1.0	-1.1	-1.1	-1.0	-1.0	-1.3	-1.5	-1.6	-1.8	-1.8	-1.7	-1.5	-1.5	-1.5	-1.5	-1.3	-1.1	-1.1	-1.0	-1.0	-1.0	-1.2	-1.2	-1.1	-1.1	-1.0
-1.8	-2.1	-2.1	-1.9	-1.5	-1.7	-1.5	-1.4	-1.5	-1.6	-1.5	-1.5	-1.5	-1.7	-1.9	-1.9	-2.0	-2.2	-2.0	-1.8	-1.9	-1.7	-1.6	-1.6	-1.6	-1.5	-1.4	-1.5	-1.3	-1.2	-1.4	-1.4	-1.6	-1.9	-2.0	-1.9
-2.1	-2.3	-2.7	-2.7	-2.4	-2.2	-2.3	-2.2	-2.4	-2.5	-2.6	-2.5	-2.6	-2.8	-2.7	-2.5	-2.4	-2.4	-2.4	-2.1	-2.2	-1.9	-2.0	-2.2	-2.5	-2.9	-3.1	-2.8	-2.4	-2.1	-1.9	-2.1	-2.7	-3.1	-3.3	-3.1
-2.6	-2.6	-4.0	-3.4	-2.6	-2.4	-2.8	-3.7	-4.1	-3.5	-3.3	-3.2	-3.1	-3.2	-2.6	-2.4	-2.3	-2.2	-2.3	-2.1	-2.3	-2.6	-3.2	-3.6	-3.7	-3.4	-3.7	-4.2	-3.6	-3.6	-3.7	-3.6	-3.8	-3.8	-3.3	-3.1
-3.3	-3.3	-3.8	-3.4	-2.9	-3.0	-4.1	-4.4	-3.7	-3.2	-3.0	-3.3	-3.1	-3.2	-2.8	-2.6	-2.8	-2.9	-3.2	-3.1	-2.9	-2.9	-3.1	-3.5	-3.5	-3.2	-3.5	-3.8	-3.5	-3.9	-4.0	-3.4	-3.1	-3.1	-3.2	-3.5
-4.2	-4.2	-3.8	-3.8	-3.8	-4.0	-4.7	-4.0	-3.6	-3.8	-3.8	-3.7	-3.7	-3.6	-3.7	-3.7	-3.8	-4.8	-5.4	-4.7	-3.7	-3.3	-3.4	-3.5	-3.5	-3.7	-3.5	-3.5	-4.3	-3.4	-3.7	-3.8	-3.8	-4.0	-4.3	-4.5
-4.5	-4.4	-5.3	-4.7	-4.6	-4.2	-4.3	-4.1	-5.0	-5.2	-5.7	-6.0	-5.3	-4.8	-4.9	-4.6	-4.8	-6.0	-9.1	-7.2	-5.6	-4.3	-4.0	-4.0	-4.6	-5.6	-5.4	-5.9	-4.8	-4.7	-4.2	-4.7	-4.9	-5.8	-5.8	-5.8
-3.7	-3.8	-3.6	-3.6	-3.9	-3.7	-3.6	-3.7	-3.6	-3.9	-6.0	-6.5	-6.1	-5.7	-4.9	-5.1	-5.2	-4.9	-5.6	-7.3	-6.3	-4.1	-3.8	-4.4	-5.0	-5.3	-5.5	-5.4	-5.3	-4.9	-4.5	-5.7	-6.8	-6.0	-5.3	-4.7
-5.5	-5.3	-5.1	-3.9	-3.6	-3.4	-3.2	-3.1	-3.1	-3.2	-4.1	-4.7	-4.5	-3.6	-3.7	-3.8	-3.6	-3.3	-3.3	-3.9	-3.6	-3.4	-3.4	-3.8	-4.4	-4.2	-4.4	-4.2	-3.7	-3.7	-3.7	-3.8	-4.5	-4.9	-5.0	-5.8
-3.9	-3.5	-4.1	-5.6	-4.7	-3.5	-3.2	-2.9	-2.9	-3.0	-2.9	-3.6	-4.1	-3.4	-3.2	-3.2	-3.2	-2.9	-2.9	-3.0	-3.2	-3.1	-3.1	-3.6	-3.2	-3.2	-3.3	-3.5	-3.2	-3.2	-3.4	-3.0	-3.0	-3.2	-3.4	-3.5
-2.7	-3.0	-3.0	-3.5	-4.6	-4.2	-3.7	-3.4	-2.9	-2.6	-2.4	-2.9	-3.6	-3.8	-3.7	-3.4	-2.9	-3.0	-2.8	-3.0	-3.1	-2.8	-2.7	-2.9	-3.0	-2.7	-2.7	-2.9	-2.9	-2.9	-3.1	-2.9	-2.9	-2.9	-2.9	-2.8
-2.3	-2.3	-2.3	-2.3	-2.5	-2.9	-3.1	-3.2	-2.9	-2.5	-2.5	-2.5	-2.4	-2.4	-2.5	-2.3	-1.9	-2.2	-2.3	-2.5	-2.7	-2.5	-2.7	-2.5	-2.3	-2.2	-2.2	-2.4	-2.4	-2.4	-2.4	-2.4	-2.5	-2.7	-2.7	-2.5
-1.9	-1.9	-2.0	-2.0	-1.9	-2.1	-1.9	-2.0	-2.1	-2.0	-2.1	-2.2	-2.0	-1.9	-1.9	-1.7	-1.4	-1.5	-1.7	-2.0	-2.3	-2.3	-2.2	-2.3	-2.0	-1.7	-1.7	-1.7	-1.7	-1.8	-2.0	-2.2	-2.2	-2.2	-2.2	-2.1
-1.3	-1.2	-1.2	-1.3	-1.3	-1.4	-1.5	-1.5	-1.5	-1.7	-1.9	-2.0	-1.9	-1.7	-1.5	-1.4	-1.3	-1.4	-1.6	-1.7	-1.7	-1.6	-1.6	-1.4	-1.4	-1.4	-1.5	-1.6	-1.7	-1.7	-1.6	-1.6	-1.6	-1.5	-1.6	-1.5
-1.3	-1.3	-1.3	-1.2	-1.2	-1.2	-1.4	-1.7	-2.0	-2.0	-2.2	-2.1	-1.8	-1.6	-1.5	-1.4	-1.4	-1.2	-1.0	-.9	-.8	-.6	-.4	-.6	-.9	-1.0	-.6	-.3	-.5	-.5	-.5	-.6	-.7	-.9	-1.2	-1.3
-1.5	-1.5	-1.5	-1.5	-1.4	-1.4	-1.4	-1.2	-1.4	-1.7	-1.8	-1.8	-1.7	-1.6	-1.4	-1.3	-1.2	-1.1	-.9	-.8	-.7	-.6	-.4	-.2	-.2	-.3	-.4	-.4	-.5	-.6	-.7	-.8	-1.0	-1.1	-1.4	-1.5

Figure 42. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2002
Channel: HIRS8 (Surface)
NOAA16, using all observations



-7.3	-7.0	-6.9	-7.0	-7.2	-7.8	-8.5	-8.6	-7.4	-4.8	-.4	-4.8	-4.3	-3.8	-1.6	-4.0	-6.1	-7.1	-7.8	-7.6	-7.4	-6.7	-7.0	-8.1	-6.9	-5.4	-6.0	-7.0	-6.8	-7.1	-7.4	-7.3	-7.5	-7.6	-7.4	-7.4
-6.4	-5.1	-6.1	-6.5	-6.5	-7.1	-7.7	-8.3	-7.7	-6.1	-2.6	-2.9	-1.5	-1.5	-1.8	-3.5	-9.6	-11.7	-14.1	-11.2	-9.4	-10.0	-9.3	-8.9	-8.2	-6.5	-6.6	-6.8	-6.9	-6.6	-5.8	-7.5	-9.2	-8.6	-7.8	-7.2
-8.7	-9.4	-10.4	-8.8	-8.3	-9.1	-8.2	-7.3	-7.4	-5.8	-4.9	-4.8	-7.2	-4.2	-9.0	-13.2	-14.9	-12.7	-12.6	-9.9	-8.6	-8.5	-7.4	-7.0	-8.4	-7.3	-7.2	-5.7	-7.9	-6.6	-7.4	-7.7	-5.6	-7.5	-7.7	-7.5
-12.9	-12.2	-10.8	-8.7	-9.3	-9.4	-10.3	-9.5	-9.7	-8.6	-7.9	-8.4	-12.0	-14.9	-15.9	-16.9	-14.8	-13.7	-12.3	-10.3	-9.8	-9.4	-8.3	-8.4	-9.0	-7.8	-8.7	-9.8	-9.2	-8.0	-12.4	-12.4	-11.5	-14.4	-14.3	-14.5
-12.9	-14.6	-15.2	-11.8	-10.9	-8.4	-9.0	-10.7	-12.2	-13.0	-13.0	-11.6	-12.3	-15.8	-15.2	-12.0	-10.0	-9.6	-12.9	-13.6	-12.2	-8.6	-11.1	-13.9	-15.7	-15.5	-16.5	-10.5	-8.8	-8.3	-11.7	-13.4	-13.4	-15.5	-18.2	-18.9
-12.7	-14.5	-20.7	-13.8	-10.8	-6.4	-.9	-10.4	-14.2	-12.1	-11.2	-11.8	-12.6	-11.0	-6.4	-6.2	-6.9	-4.3	-4.9	-6.8	-8.1	-10.5	-17.2	-15.3	-13.5	-11.3	-10.3	-11.4	-9.9	-12.6	-15.6	-16.0	-18.0	-17.6	-15.4	-16.3
-11.0	-10.6	-12.7	-9.8	-8.5	-9.4	-14.5	-13.4	-6.1	-5.3	-4.4	-9.6	-8.8	-9.3	-5.3	-4.7	-5.4	-3.3	-6.1	-4.6	-3.9	-.9	-5.4	-6.1	-3.4	-3.8	-9.5	-13.6	-7.9	-11.1	-12.3	-7.3	-5.2	-5.8	-10.4	-13.0
-11.0	-9.6	-6.1	-7.4	-9.1	-12.5	-16.5	-7.0	-3.8	-5.3	-6.4	-8.3	-7.7	-6.0	-6.2	-5.3	-4.9	-13.2	-12.2	-6.1	2.5	3.9	-.7	-2.2	-1.2	-4.4	-3.1	-2.9	-9.2	-2.2	-4.8	-5.1	-5.8	-6.6	-11.8	-12.9
-12.1	-10.9	-15.3	-13.1	-12.8	-10.9	-10.6	-9.2	-14.6	-13.7	-19.7	-20.2	-17.5	-12.8	-12.6	-10.8	-12.6	-20.9	-34.2	-24.2	-16.8	-8.1	-6.2	-5.8	-9.6	-15.2	-14.7	-17.0	-10.0	-10.4	-8.1	-10.9	-12.0	-19.4	-20.8	-19.0
-5.5	-5.9	-4.4	-5.1	-7.7	-6.8	-5.9	-6.6	-5.8	-7.7	-23.1	-23.4	-21.4	-18.0	-13.7	-13.3	-13.6	-10.5	-14.2	-24.3	-20.5	-9.5	-6.8	-9.1	-12.9	-14.2	-15.1	-13.8	-16.5	-13.0	-11.2	-18.6	-22.8	-18.1	-14.6	-11.0
-16.4	-15.5	-15.7	-7.9	-6.0	-5.1	-5.4	-5.1	-4.7	-5.0	-9.7	-10.5	-10.5	-6.2	-6.2	-4.7	-3.5	-2.5	-2.7	-5.6	-2.4	-5.6	-5.0	-8.4	-10.3	-7.6	-8.2	-7.5	-5.1	-3.9	-2.3	-3.5	-9.3	-12.2	-12.5	-19.0
-14.2	-9.7	-13.7	-25.3	-16.7	-9.6	-7.4	-5.9	-6.7	-7.8	-5.5	-4.0	-10.5	-6.2	-4.2	-5.0	-5.8	-4.5	-3.8	-2.5	-4.3	-6.9	-6.6	-12.9	-7.6	-7.4	-8.1	-8.5	-6.9	-5.9	-11.0	-4.8	-2.1	-7.7	-10.1	-11.6
-10.5	-13.6	-14.0	-16.9	-24.2	-21.5	-16.0	-12.7	-10.0	-10.2	-7.3	-6.2	-13.9	-16.2	-14.9	-14.0	-12.5	-14.0	-12.1	-10.8	-10.0	-11.7	-9.2	-12.5	-13.1	-10.4	-11.5	-14.3	-14.1	-11.7	-13.4	-12.5	-9.1	-10.5	-12.4	-12.4
-13.1	-13.1	-14.0	-12.4	-12.5	-15.0	-15.2	-16.3	-14.7	-13.9	-14.7	-10.5	-12.0	-14.7	-14.6	-14.7	-13.2	-15.4	-15.9	-15.6	-13.8	-11.1	-11.2	-10.8	-10.7	-12.0	-14.4	-15.5	-15.3	-13.8	-12.9	-12.4	-11.3	-13.0	-13.0	-12.3
-15.4	-15.9	-15.5	-15.2	-16.1	-15.8	-14.9	-15.8	-16.3	-15.9	-16.6	-16.6	-15.1	-13.0	-14.3	-15.3	-13.0	-14.5	-13.8	-14.5	-15.6	-14.8	-13.9	-14.7	-14.2	-14.4	-14.5	-14.8	-14.2	-13.5	-14.5	-14.5	-13.2	-13.0	-13.5	-15.3
-16.9	-15.8	-15.1	-14.9	-15.1	-15.5	-15.7	-14.8	-14.3	-14.6	-16.0	-15.0	-13.5	-11.8	-12.9	-12.6	-12.0	-14.3	-15.7	-15.5	-14.4	-14.1	-13.0	-10.4	-11.7	-13.0	-11.8	-11.9	-11.5	-11.3	-10.7	-9.9	-11.9	-13.4	-16.2	-17.7
-9.5	-8.6	-7.9	-6.2	-6.1	-4.2	-6.1	-9.8	-8.9	-7.4	-9.5	-7.3	-10.4	-7.4	-7.0	-3.6	-5.0	-2.9	-1.3	.2	-.2	2.0	2.5	2.4	1.3	.7	3.3	5.7	4.0	4.6	3.0	2.1	.8	-.5	-4.8	-10.7
-7.6	-7.6	-5.0	1.3	1.2	.6	1.3	4.2	4.6	-.2	-3.9	-7.0	-5.6	-4.1	-1.4	.7	.8	1.9	2.5	2.7	2.6	2.5	3.8	4.7	4.3	4.1	3.7	4.1	3.9	3.5	2.2	1.7	1.2	3.0	-4.4	-7.8

Figure 43. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2002
Channel: HIRS15 (700 hPa)
NOAA16, using all observations

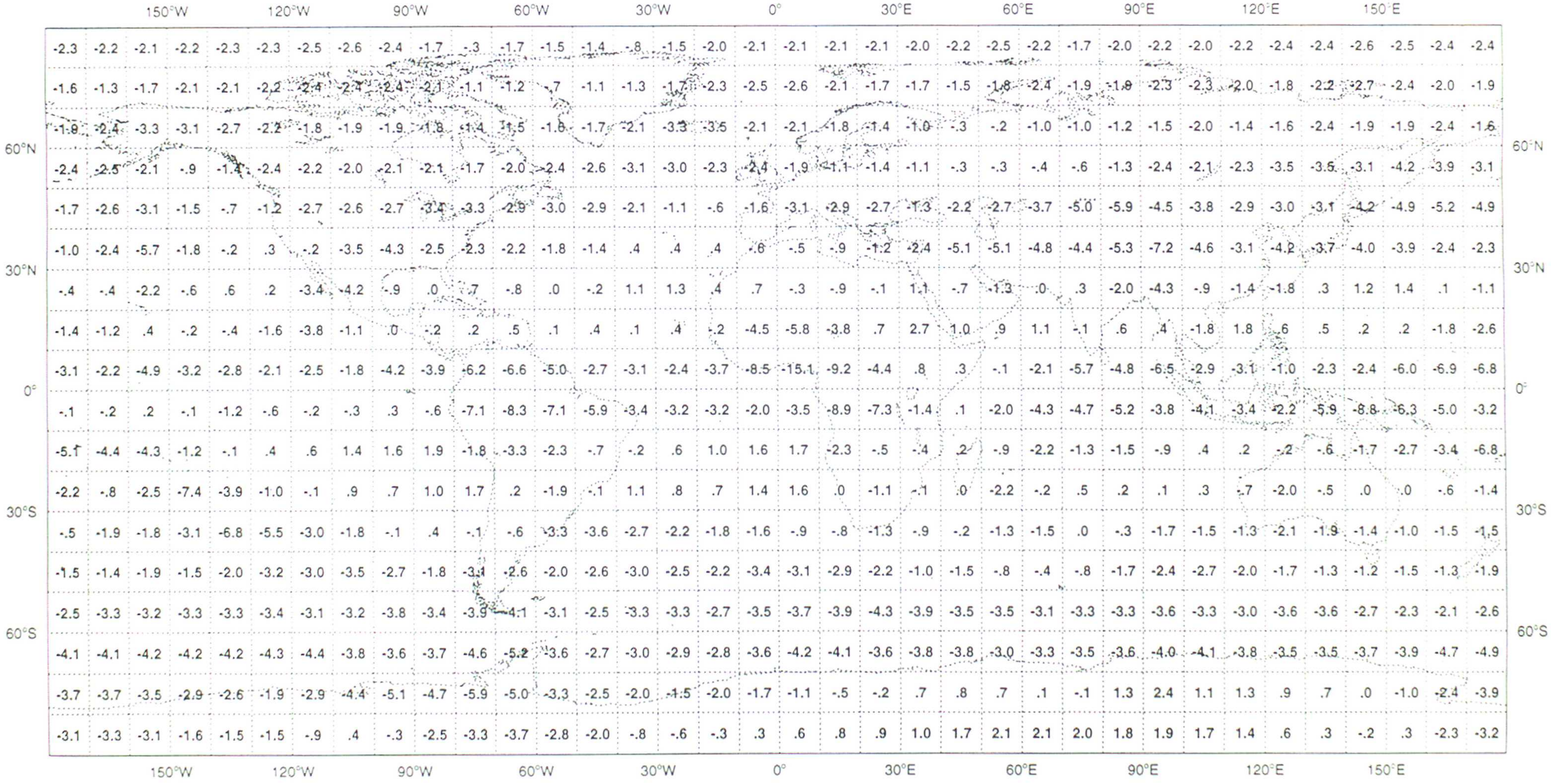

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
-2.3 -2.2 -2.1 -2.2 -2.3 -2.3 -2.5 -2.6 -2.4 -1.7 -.3 -1.7 -1.5 -1.4 -.8 -1.5 -2.0 -2.1 -2.1 -2.1 -2.1 -2.0 -2.2 -2.5 -2.2 -1.7 -2.0 -2.2 -2.0 -2.2 -2.4 -2.4 -2.6 -2.5 -2.4 -2.4
-1.6 -1.3 -1.7 -2.1 -2.1 -2.2 -2.4 -2.4 -2.4 -2.1 -1.1 -1.2 -.7 -1.1 -1.3 -1.7 -2.3 -2.5 -2.6 -2.1 -1.7 -1.7 -1.5 -1.8 -2.4 -1.9 -1.9 -2.3 -2.3 -2.0 -1.8 -2.2 -2.7 -2.4 -2.0 -1.9
-1.9 -2.4 -3.3 -3.1 -2.7 -2.2 -1.8 -1.9 -1.9 -1.8 -1.4 -1.5 -1.6 -1.7 -2.1 -3.3 -3.5 -2.1 -2.1 -1.8 -1.4 -1.0 -.3 -.2 -1.0 -1.0 -1.2 -1.5 -2.0 -1.4 -1.6 -2.4 -1.9 -1.9 -2.4 -1.6
-2.4 -2.5 -2.1 -.9 -1.4 -2.4 -2.2 -2.0 -2.1 -2.1 -1.7 -2.0 -2.4 -2.6 -3.1 -3.0 -2.3 -2.4 -1.9 -1.1 -1.4 -1.1 -.3 -.3 -.4 -.6 -1.3 -2.4 -2.1 -2.3 -3.5 -3.5 -3.1 -4.2 -3.9 -3.1
-1.7 -2.6 -3.1 -1.5 -.7 -1.2 -2.7 -2.6 -2.7 -3.4 -3.3 -2.9 -3.0 -2.9 -2.1 -1.1 -.6 -1.6 -3.1 -2.9 -2.7 -1.3 -2.2 -2.7 -3.7 -5.0 -5.9 -4.5 -3.8 -2.9 -3.0 -3.1 -4.2 -4.9 -5.2 -4.9
-1.0 -2.4 -5.7 -1.8 -.2 .3 -.2 -3.5 -4.3 -2.5 -2.3 -2.2 -1.8 -1.4 .4 .4 .4 -.6 -.5 -.9 -1.2 -2.4 -5.1 -5.1 -4.8 -4.4 -5.3 -7.2 -4.6 -3.1 -4.2 -3.7 -4.0 -3.9 -2.4 -2.3
-.4 -.4 -2.2 -.6 .6 .2 -3.4 -4.2 -.9 .0 .7 -.8 .0 -.2 1.1 1.3 .4 .7 -.3 -.9 -.1 1.1 -.7 -1.3 .0 .3 -2.0 -4.3 -.9 -1.4 -1.8 .3 1.2 1.4 .1 -1.1
-1.4 -1.2 .4 -.2 -.4 -1.6 -3.8 -1.1 .0 -.2 .2 .5 .1 .4 .1 .4 -.2 -4.5 -5.8 -3.8 .7 2.7 1.0 .9 1.1 -.1 .6 .4 -1.8 1.8 .6 .5 .2 .2 -1.8 -2.6
-3.1 -2.2 -4.9 -3.2 -2.8 -2.1 -2.5 -1.8 -4.2 -3.9 -6.2 -6.6 -5.0 -2.7 -3.1 -2.4 -3.7 -8.5 -15.1 -9.2 -4.4 .8 .3 -.1 -2.1 -5.7 -4.8 -6.5 -2.9 -3.1 -1.0 -2.3 -2.4 -6.0 -6.9 -6.8
-.1 -.2 .2 -.1 -1.2 -.6 -.2 -.3 .3 -.6 -7.1 -8.3 -7.1 -5.9 -3.4 -3.2 -3.2 -2.0 -3.5 -8.9 -7.3 -1.4 .1 -2.0 -4.3 -4.7 -5.2 -3.8 -4.1 -3.4 -2.2 -5.9 -8.8 -6.3 -5.0 -3.2
-5.1 -4.4 -4.3 -1.2 -.1 .4 .6 1.4 1.6 1.9 -1.8 -3.3 -2.3 -.7 -.2 .6 1.0 1.6 1.7 -2.3 -.5 -.4 .2 -.9 -2.2 -1.3 -1.5 -.9 .4 .2 -.2 -.6 -1.7 -2.7 -3.4 -6.8
-2.2 -.8 -2.5 -7.4 -3.9 -1.0 -.1 .9 .7 1.0 1.7 .2 -1.9 -.1 1.1 .8 .7 1.4 1.6 .0 -1.1 -.1 .0 -2.2 -.2 .5 .2 .1 .3 -.7 -2.0 -.5 .0 .0 -.6 -1.4
-.5 -1.9 -1.8 -3.1 -6.8 -5.5 -3.0 -1.8 -.1 .4 -.1 -.6 -3.3 -3.6 -2.7 -2.2 -1.8 -1.6 -.9 -.8 -1.3 -.9 -.2 -1.3 -1.5 .0 -.3 -1.7 -1.5 -1.3 -2.1 -1.9 -1.4 -1.0 -1.5 -1.5
-1.5 -1.4 -1.9 -1.5 -2.0 -3.2 -3.0 -3.5 -2.7 -1.8 -3.1 -2.6 -2.0 -2.6 -3.0 -2.5 -2.2 -3.4 -3.1 -2.9 -2.2 -1.0 -1.5 -.8 -.4 -.8 -1.7 -2.4 -2.7 -2.0 -1.7 -1.3 -1.2 -1.5 -1.3 -1.9
-2.5 -3.3 -3.2 -3.3 -3.3 -3.4 -3.1 -3.2 -3.8 -3.4 -3.9 -4.1 -3.1 -2.5 -3.3 -3.3 -2.7 -3.5 -3.7 -3.9 -4.3 -3.9 -3.5 -3.5 -3.1 -3.3 -3.3 -3.6 -3.3 -3.0 -3.6 -3.6 -2.7 -2.3 -2.1 -2.6
-4.1 -4.1 -4.2 -4.2 -4.2 -4.3 -4.4 -3.8 -3.6 -3.7 -4.6 -5.2 -3.6 -2.7 -3.0 -2.9 -2.8 -3.6 -4.2 -4.1 -3.6 -3.8 -3.8 -3.0 -3.3 -3.5 -3.6 -4.0 -4.1 -3.8 -3.5 -3.5 -3.7 -3.9 -4.7 -4.9
-3.7 -3.7 -3.5 -2.9 -2.6 -1.9 -2.9 -4.4 -5.1 -4.7 -5.9 -5.0 -3.3 -2.5 -2.0 -1.5 -2.0 -1.7 -1.1 -.5 -.2 .7 .8 .7 .1 -.1 1.3 2.4 1.1 1.3 .9 .7 .0 -1.0 -2.4 -3.9
-3.1 -3.3 -3.1 -1.6 -1.5 -1.5 -.9 .4 -.3 -2.5 -3.3 -3.7 -2.8 -2.0 -.8 -.6 -.3 .3 .6 .8 .9 1.0 1.7 2.1 2.1 2.0 1.8 1.9 1.7 1.4 .6 .3 -.2 .3 -2.3 -3.2
150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E

Figure 44. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2002
Channel: HIRS15 (700 hPa)
NOAA16, using all observations

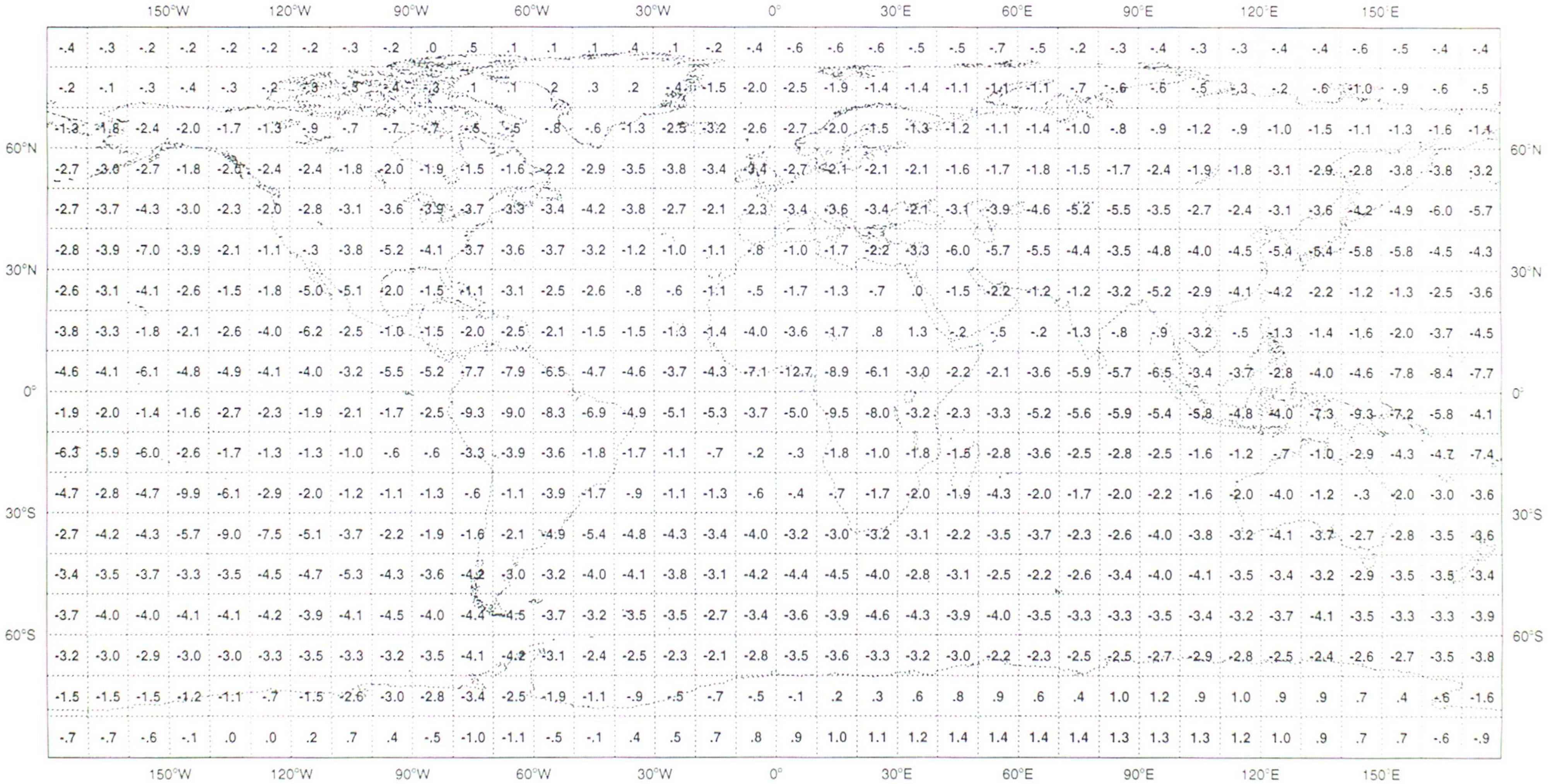

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
-.4 -.3 -.2 -.2 -.2 -.2 -.2 -.3 -.2 .0 .5 .1 .1 .1 .4 .1 -.2 -.4 -.6 -.6 -.6 -.5 -.5 -.7 -.5 -.2 -.3 -.4 -.3 -.3 -.4 -.4 -.6 -.5 -.4 -.4
-.2 -.1 -.3 -.4 -.3 -.2 -.3 -.5 -.4 -.3 .1 .1 .2 .3 .2 -.4 -1.5 -2.0 -2.5 -1.9 -1.4 -1.4 -1.1 -1.1 -1.1 -.7 -.6 -.6 -.5 -.3 -.2 -.6 -1.0 -.9 -.6 -.5
-1.3 -1.8 -2.4 -2.0 -1.7 -1.3 -.9 -.7 -.7 -.7 -.5 -.5 -.8 -.6 -1.3 -2.5 -3.2 -2.6 -2.7 -2.0 -1.5 -1.3 -1.2 -1.1 -1.4 -1.0 -.8 -.9 -1.2 -.9 -1.0 -1.5 -1.1 -1.3 -1.6 -1.4
-2.7 -3.6 -2.7 -1.8 -2.0 -2.4 -2.4 -1.8 -2.0 -1.9 -1.5 -1.6 -2.2 -2.9 -3.5 -3.8 -3.4 -3.4 -2.7 -2.1 -2.1 -2.1 -1.6 -1.7 -1.8 -1.5 -1.7 -2.4 -1.9 -1.8 -3.1 -2.9 -2.8 -3.8 -3.8 -3.2
-2.7 -3.7 -4.3 -3.0 -2.3 -2.0 -2.8 -3.1 -3.6 -3.9 -3.7 -3.3 -3.4 -4.2 -3.8 -2.7 -2.1 -2.3 -3.4 -3.6 -3.4 -2.1 -3.1 -3.9 -4.6 -5.2 -5.5 -3.5 -2.7 -2.4 -3.1 -3.6 -4.2 -4.9 -6.0 -5.7
-2.8 -3.9 -7.0 -3.9 -2.1 -1.1 -.3 -3.8 -5.2 -4.1 -3.7 -3.6 -3.7 -3.2 -1.2 -1.0 -1.1 -.8 -1.0 -1.7 -2.2 -3.3 -6.0 -5.7 -5.5 -4.4 -3.5 -4.8 -4.0 -4.5 -5.4 -5.4 -5.8 -5.8 -4.5 -4.3
-2.6 -3.1 -4.1 -2.6 -1.5 -1.8 -5.0 -5.1 -2.0 -1.5 -1.1 -3.1 -2.5 -2.6 -.8 -.6 -1.1 -.5 -1.7 -1.3 -.7 .0 -1.5 -2.2 -1.2 -1.2 -3.2 -5.2 -2.9 -4.1 -4.2 -2.2 -1.2 -1.3 -2.5 -3.6
-3.8 -3.3 -1.8 -2.1 -2.6 -4.0 -6.2 -2.5 -1.0 -1.5 -2.0 -2.5 -2.1 -1.5 -1.5 -1.3 -1.4 -4.0 -3.6 -1.7 .8 1.3 -.2 -.5 -.2 -1.3 -.8 -.9 -3.2 -.5 -1.3 -1.4 -1.6 -2.0 -3.7 -4.5
-4.6 -4.1 -6.1 -4.8 -4.9 -4.1 -4.0 -3.2 -5.5 -5.2 -7.7 -7.9 -6.5 -4.7 -4.6 -3.7 -4.3 -7.1 -12.7 -8.9 -6.1 -3.0 -2.2 -2.1 -3.6 -5.9 -5.7 -6.5 -3.4 -3.7 -2.8 -4.0 -4.6 -7.8 -8.4 -7.7
-1.9 -2.0 -1.4 -1.6 -2.7 -2.3 -1.9 -2.1 -1.7 -2.5 -9.3 -9.0 -8.3 -6.9 -4.9 -5.1 -5.3 -3.7 -5.0 -9.5 -8.0 -3.2 -2.3 -3.3 -5.2 -5.6 -5.9 -5.4 -5.8 -4.8 -4.0 -7.3 -9.3 -7.2 -5.8 -4.1
-6.3 -5.9 -6.0 -2.6 -1.7 -1.3 -1.3 -1.0 -.6 -.6 -3.3 -3.9 -3.6 -1.8 -1.7 -1.1 -.7 -.2 -.3 -1.8 -1.0 -1.8 -1.5 -2.8 -3.6 -2.5 -2.8 -2.5 -1.6 -1.2 -.7 -1.0 -2.9 -4.3 -4.7 -7.4
-4.7 -2.8 -4.7 -9.9 -6.1 -2.9 -2.0 -1.2 -1.1 -1.3 -.6 -1.1 -3.9 -1.7 -.9 -1.1 -1.3 -.6 -.4 -.7 -1.7 -2.0 -1.9 -4.3 -2.0 -1.7 -2.0 -2.2 -1.6 -2.0 -4.0 -1.2 -.3 -2.0 -3.0 -3.6
-2.7 -4.2 -4.3 -5.7 -9.0 -7.5 -5.1 -3.7 -2.2 -1.9 -1.6 -2.1 -4.9 -5.4 -4.8 -4.3 -3.4 -4.0 -3.2 -3.0 -3.2 -3.1 -2.2 -3.5 -3.7 -2.3 -2.6 -4.0 -3.8 -3.2 -4.1 -3.7 -2.7 -2.8 -3.5 -3.6
-3.4 -3.5 -3.7 -3.3 -3.5 -4.5 -4.7 -5.3 -4.3 -3.6 -4.2 -3.0 -3.2 -4.0 -4.1 -3.8 -3.1 -4.2 -4.4 -4.5 -4.0 -2.8 -3.1 -2.5 -2.2 -2.6 -3.4 -4.0 -4.1 -3.5 -3.4 -3.2 -2.9 -3.5 -3.5 -3.4
-3.7 -4.0 -4.0 -4.1 -4.1 -4.2 -3.9 -4.1 -4.5 -4.0 -4.4 -4.5 -3.7 -3.2 -3.5 -3.5 -2.7 -3.4 -3.6 -3.9 -4.6 -4.3 -3.9 -4.0 -3.5 -3.3 -3.3 -3.5 -3.4 -3.2 -3.7 -4.1 -3.5 -3.3 -3.3 -3.9
-3.2 -3.0 -2.9 -3.0 -3.0 -3.3 -3.5 -3.3 -3.2 -3.5 -4.1 -4.2 -3.1 -2.4 -2.5 -2.3 -2.1 -2.8 -3.5 -3.6 -3.3 -3.2 -3.0 -2.2 -2.3 -2.5 -2.5 -2.7 -2.9 -2.8 -2.5 -2.4 -2.6 -2.7 -3.5 -3.8
-1.5 -1.5 -1.5 -1.2 -1.1 -.7 -1.5 -2.6 -3.0 -2.8 -3.4 -2.5 -1.9 -1.1 -.9 -.5 -.7 -.5 -.1 .2 .3 .6 .8 .9 .6 .4 1.0 1.2 .9 1.0 .9 .9 .7 .4 -.6 -1.6
-.7 -.7 -.6 -.1 .0 .0 .2 .7 .4 -.5 -1.0 -1.1 -.5 -.1 .4 .5 .7 .8 .9 1.0 1.1 1.2 1.4 1.4 1.4 1.4 1.3 1.3 1.3 1.2 1.0 .9 .7 .7 -.6 -.9
150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E

Figure 45. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2002
Channel: HIRS11 (500 - 700 hPa)
NOAA16, using all observations

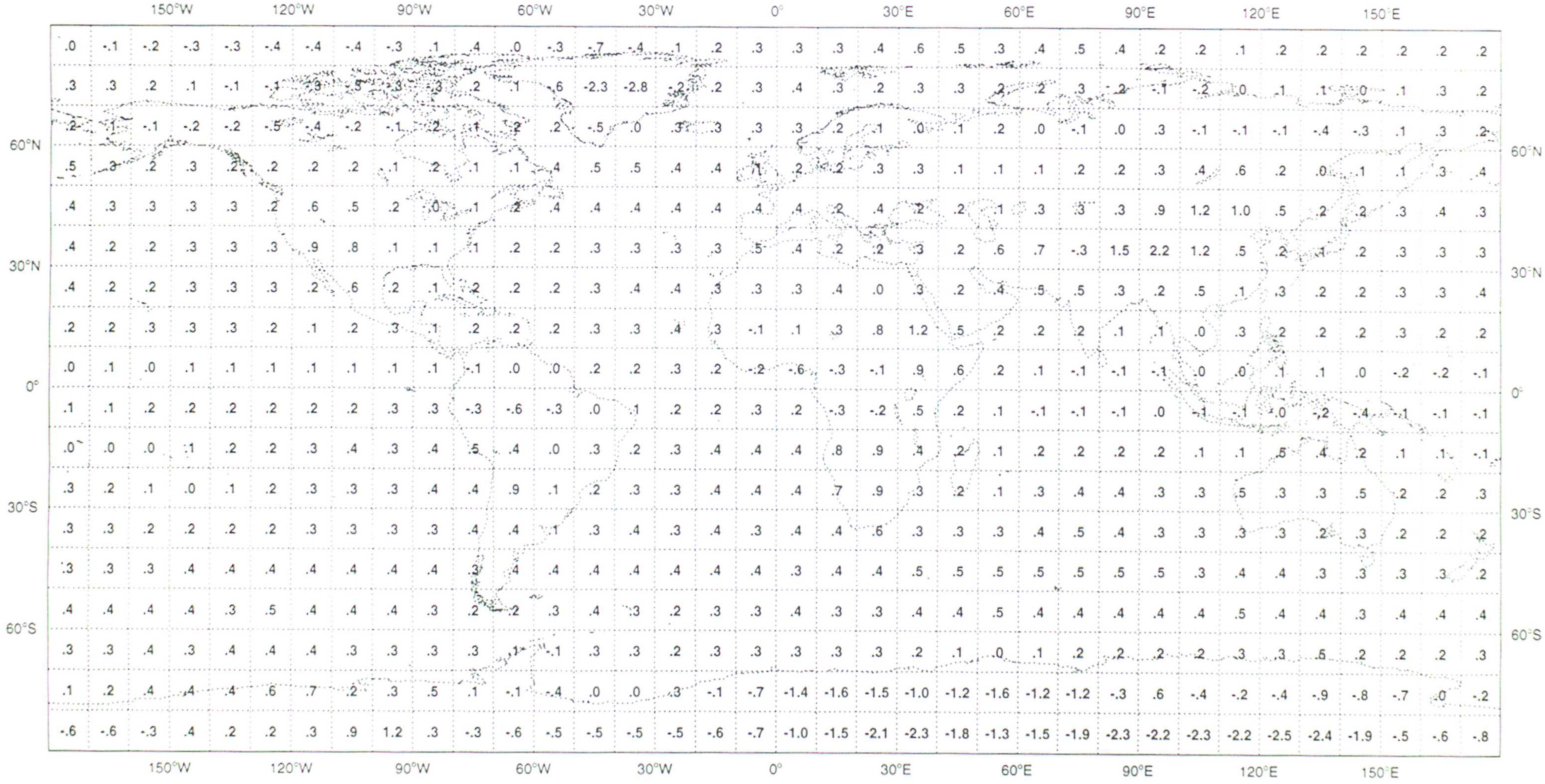

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.0 -.1 -.2 -.3 -.3 -.4 -.4 -.4 -.3 .1 .4 .0 -.3 -.7 -.4 .1 .2 .3 .3 .3 .4 .6 .5 .3 .4 .5 .4 .2 .2 .1 .2 .2 .2 .2 .2 .2
.3 .3 .2 .1 -.1 -.1 .3 .5 .3 .3 .2 .1 .6 -2.3 -2.8 -.2 .2 .3 .4 .3 .2 .3 .3 .2 .2 .3 -.2 -.1 -.2 .0 .1 .1 .0 .1 .3 .2
.2 .1 -.1 -.2 -.2 -.5 -.4 -.2 -.1 .2 .1 .2 .2 -.5 .0 .3 .3 .3 .3 .2 .1 .0 .1 .2 .0 -.1 .0 .3 -.1 -.1 -.1 -.4 -.3 .1 .3 .2
.5 .3 .2 .3 .2 .2 .2 .2 .1 .2 .1 .1 .4 .5 .5 .4 .4 .1 .2 .2 .3 .3 .1 .1 .1 .2 .2 .3 .4 .6 .2 .0 .1 .1 .3 .4
.4 .3 .3 .3 .3 .2 .6 .5 .2 .0 .1 .2 .4 .4 .4 .4 .4 .4 .4 .2 .4 .2 .2 .1 .3 .3 .3 .9 1.2 1.0 .5 .2 .2 .3 .4 .3
.4 .2 .2 .3 .3 .3 .9 .8 .1 .1 .1 .2 .2 .3 .3 .3 .3 .5 .4 .2 .2 .3 .2 .6 .7 -.3 1.5 2.2 1.2 .5 .2 .1 .2 .3 .3 .3
.4 .2 .2 .3 .3 .3 .2 .6 .2 .1 .2 .2 .2 .3 .4 .4 .3 .3 .3 .4 .0 .3 .2 .4 .5 .5 .3 .2 .5 .1 .3 .2 .2 .3 .3 .4
.2 .2 .3 .3 .3 .2 .1 .2 .3 .1 .2 .2 .2 .3 .3 .4 .3 -.1 .1 .3 .8 1.2 .5 .2 .2 .2 .1 .1 .0 .3 .2 .2 .2 .3 .2 .2
.0 .1 .0 .1 .1 .1 .1 .1 .1 .1 -.1 .0 .0 .2 .2 .3 .2 -.2 -.6 -.3 -.1 .9 .6 .2 .1 -.1 -.1 -.1 .0 .0 .1 .1 .0 -.2 -.2 -.1
.1 .1 .2 .2 .2 .2 .2 .2 .3 .3 -.3 -.6 -.3 .0 .1 .2 .2 .3 .2 -.3 -.2 .5 .2 .1 -.1 -.1 -.1 .0 -.1 -.1 .0 -.2 -.4 -.1 -.1 -.1
.0 .0 .0 .1 .2 .2 .3 .4 .3 .4 .5 .4 .0 .3 .2 .3 .4 .4 .4 .8 .9 .4 .2 .1 .2 .2 .2 .2 .1 .1 .5 .4 .2 .1 .1 -.1
.3 .2 .1 .0 .1 .2 .3 .3 .3 .4 .4 .9 .1 .2 .3 .3 .4 .4 .4 .7 .9 .3 .2 .1 .3 .4 .4 .3 .3 .5 .3 .3 .5 .2 .2 .3
.3 .3 .2 .2 .2 .2 .3 .3 .3 .3 .4 .4 .1 .3 .4 .3 .4 .3 .4 .4 .6 .3 .3 .3 .4 .5 .4 .3 .3 .3 .3 .2 .3 .2 .2 .2
.3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4 .5 .5 .5 .5 .5 .5 .5 .3 .4 .4 .3 .3 .3 .3 .2
.4 .4 .4 .4 .3 .5 .4 .4 .4 .3 .2 .2 .3 .4 .3 .2 .3 .3 .4 .3 .3 .4 .4 .5 .4 .4 .4 .4 .4 .5 .4 .4 .3 .4 .4 .4
.3 .3 .4 .3 .4 .4 .4 .3 .3 .3 .3 .1 .1 .3 .3 .2 .3 .3 .3 .3 .3 .2 .1 .0 .1 .2 .2 .2 .2 .3 .3 .5 .2 .2 .2 .3
.1 .2 .4 .4 .4 .6 .7 .2 .3 .5 .1 -.1 -.4 .0 .0 .3 -.1 -.7 -1.4 -1.6 -1.5 -1.0 -1.2 -1.6 -1.2 -1.2 -.3 .6 -.4 -.2 -.4 -.9 -.8 -.7 .0 -.2
-.6 -.6 -.3 .4 .2 .2 .3 .9 1.2 .3 -.3 -.6 -.5 -.5 -.5 -.5 -.6 -.7 -1.0 -1.5 -2.1 -2.3 -1.8 -1.3 -1.5 -1.9 -2.3 -2.2 -2.3 -2.2 -2.5 -2.4 -1.9 -.5 -.6 -.8

Figure 46. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2002
Channel: HIRS11 (500 - 700 hPa)
NOAA16, using all observations

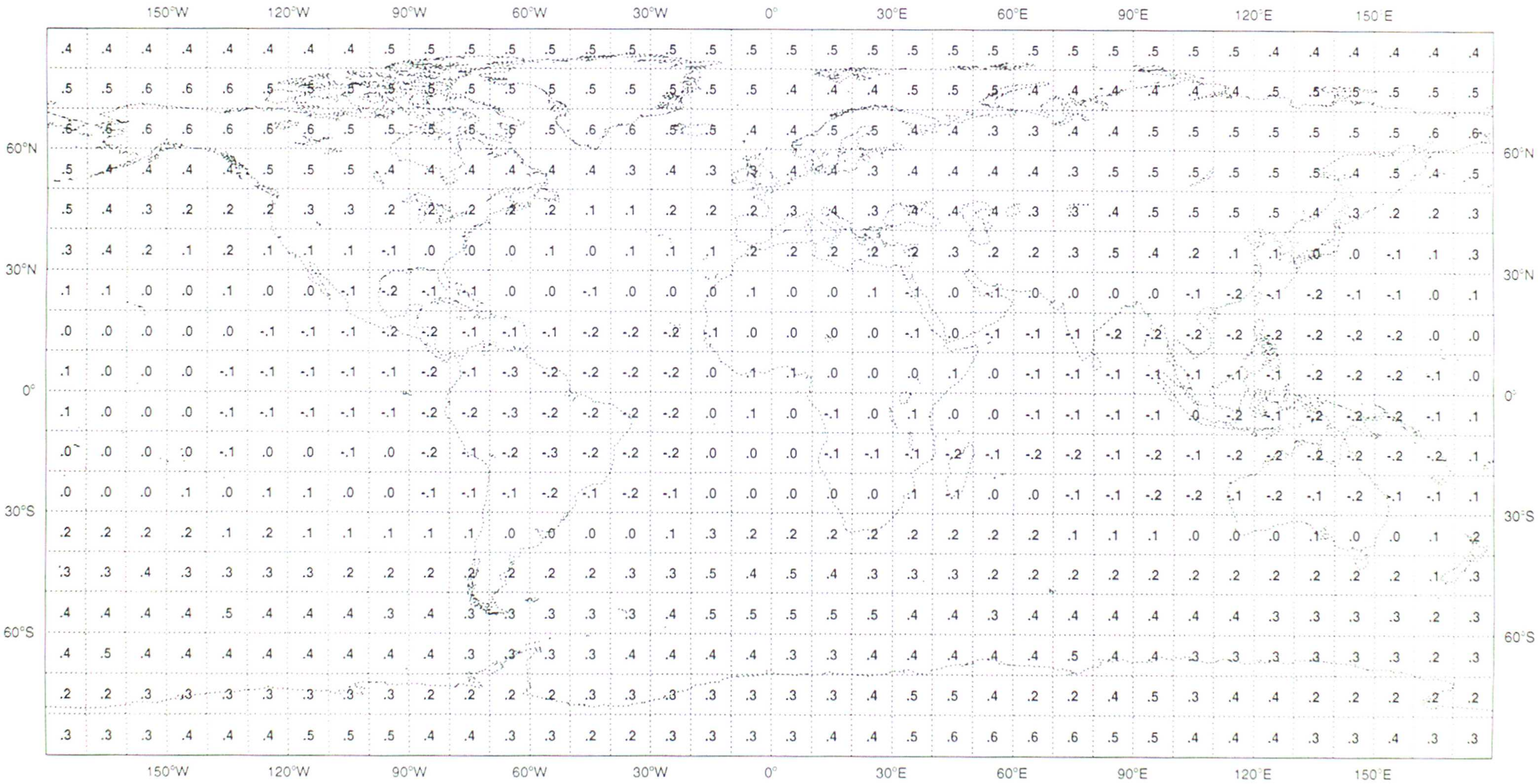

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4
.5 .5 .6 .6 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .5 .5 .5 .4 .4 .4 .4 .4 .4 .5 .5 .5 .5 .5 .5
.6 .6 .6 .6 .6 .6 .6 .5 .5 .5 .6 .6 .5 .6 .6 .5 .5 .4 .4 .5 .5 .4 .4 .3 .3 .4 .4 .5 .5 .5 .5 .5 .5 .5 .6 .6
.5 .4 .4 .4 .4 .5 .5 .5 .4 .4 .4 .4 .4 .4 .3 .4 .3 .3 .4 .4 .3 .4 .4 .4 .4 .3 .5 .5 .5 .5 .5 .5 .4 .5 .4 .5
.5 .4 .3 .2 .2 .2 .3 .3 .2 .2 .2 .2 .2 .1 .1 .2 .2 .2 .3 .4 .3 .4 .4 .4 .3 .3 .4 .5 .5 .5 .5 .4 .3 .2 .2 .3
.3 .4 .2 .1 .2 .1 .1 .1 -.1 .0 .0 .0 .1 .0 .1 .1 .1 .2 .2 .2 .2 .2 .3 .2 .2 .3 .5 .4 .2 .1 .1 .0 .0 -.1 .1 .3
.1 .1 .0 .0 .1 .0 .0 -.1 -.2 -.1 -.1 .0 .0 -.1 .0 .0 .0 .1 .0 .0 .1 -.1 .0 -.1 .0 .0 .0 .0 -.1 -.2 -.1 -.2 -.1 -.1 .0 .1
.0 .0 .0 .0 .0 -.1 -.1 -.1 -.2 -.2 -.1 -.1 -.1 -.2 -.2 -.2 -.1 .0 .0 .0 .0 -.1 .0 -.1 -.1 -.1 -.2 -.2 -.2 -.2 -.2 -.2 -.2 -.2 .0 .0
.1 .0 .0 .0 -.1 -.1 -.1 -.1 -.1 -.2 -.1 -.3 -.2 -.2 -.2 -.2 .0 .1 .1 .0 .0 .0 .1 .0 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.2 -.2 -.2 -.1 .0
.1 .0 .0 .0 -.1 -.1 -.1 -.1 -.1 -.2 -.2 -.3 -.2 -.2 -.2 -.2 .0 .1 .0 -.1 .0 .1 .0 .0 -.1 -.1 -.1 -.1 .0 -.2 -.1 -.2 -.2 -.2 -.1 .1
.0 .0 .0 .0 -.1 .0 .0 -.1 .0 -.2 -.1 -.2 -.3 -.2 -.2 -.2 .0 .0 .0 -.1 -.1 -.1 -.2 -.1 -.2 -.2 -.1 -.2 -.1 -.2 -.2 -.2 -.2 -.2 -.2 .1
.0 .0 .0 .1 .0 .1 .1 .0 .0 -.1 -.1 -.1 -.2 -.1 -.2 -.1 .0 .0 .0 .0 .0 .1 -.1 .0 .0 -.1 -.1 -.2 -.2 -.1 -.2 -.1 -.2 -.1 -.1 .1
.2 .2 .2 .2 .1 .2 .1 .1 .1 .1 .1 .0 .0 .0 .0 .1 .3 .2 .2 .2 .2 .2 .2 .2 .2 .1 .1 .1 .0 .0 .0 .1 .0 .0 .1 .2
.3 .3 .4 .3 .3 .3 .3 .2 .2 .2 .2 .2 .2 .2 .3 .3 .5 .4 .5 .4 .3 .3 .3 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .1 .3
.4 .4 .4 .4 .5 .4 .4 .4 .3 .4 .3 .3 .3 .3 .3 .4 .5 .5 .5 .5 .5 .4 .4 .3 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .2 .3
.4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .4 .4 .4 .4 .3 .3 .4 .4 .4 .4 .4 .5 .4 .4 .3 .3 .3 .3 .3 .3 .2 .3
.2 .2 .3 .3 .3 .3 .3 .3 .3 .2 .2 .2 .2 .3 .3 .3 .3 .3 .3 .3 .4 .5 .5 .4 .2 .2 .4 .5 .3 .4 .4 .2 .2 .2 .2 .2
.3 .3 .3 .4 .4 .4 .5 .5 .5 .4 .4 .3 .3 .2 .2 .3 .3 .3 .3 .4 .4 .5 .6 .6 .6 .6 .5 .5 .4 .4 .4 .3 .3 .4 .3 .3

Figure 47. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2002
Channel: HIRS4 (400 hPa)
NOAA16, using all observations

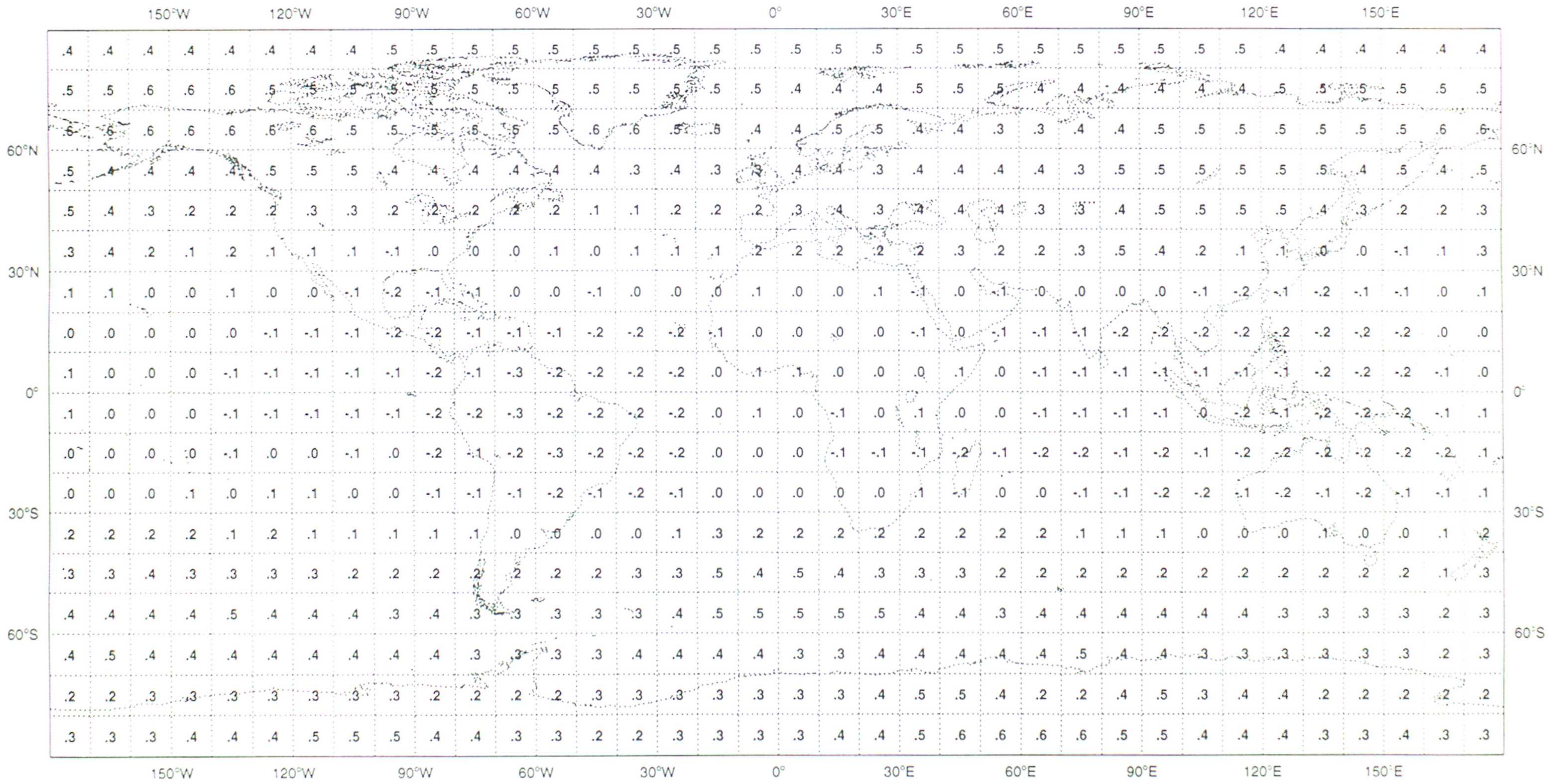

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4
.5 .5 .6 .6 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .5 .5 .5 .4 .4 .4 .4 .4 .4 .5 .5 .5 .5 .5 .5
.6 .6 .6 .6 .6 .6 .6 .5 .5 .5 .5 .5 .5 .6 .6 .5 .5 .4 .4 .5 .5 .4 .4 .3 .3 .4 .4 .5 .5 .5 .5 .5 .5 .5 .6 .6
.5 .4 .4 .4 .4 .5 .5 .5 .4 .4 .4 .4 .4 .4 .3 .4 .3 .3 .4 .4 .3 .4 .4 .4 .4 .3 .5 .5 .5 .5 .5 .5 .4 .5 .4 .5
.5 .4 .3 .2 .2 .2 .3 .3 .2 .2 .2 .2 .2 .1 .1 .2 .2 .2 .3 .4 .3 .4 .4 .4 .3 .3 .4 .5 .5 .5 .5 .4 .3 .2 .2 .3
.3 .4 .2 .1 .2 .1 .1 .1 -.1 .0 .0 .0 .1 .0 .1 .1 .1 .2 .2 .2 .2 .2 .3 .2 .2 .3 .5 .4 .2 .1 .1 .0 .0 -.1 .1 .3
.1 .1 .0 .0 .1 .0 .0 -.1 -.2 -.1 -.1 .0 .0 -.1 .0 .0 .0 .1 .0 .0 .1 -.1 .0 -.1 .0 .0 .0 .0 -.1 -.2 -.1 -.2 -.1 -.1 .0 .1
.0 .0 .0 .0 .0 -.1 -.1 -.1 -.2 -.2 -.1 -.1 -.1 -.2 -.2 -.2 -.1 .0 .0 .0 .0 -.1 .0 -.1 -.1 -.1 -.2 -.2 -.2 -.2 -.2 -.2 -.2 -.2 .0 .0
.1 .0 .0 .0 -.1 -.1 -.1 -.1 -.1 -.2 -.1 -.3 -.2 -.2 -.2 -.2 .0 .1 .1 .0 .0 .0 .1 .0 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.2 -.2 -.2 -.1 .0
.1 .0 .0 .0 -.1 -.1 -.1 -.1 -.1 -.2 -.2 -.3 -.2 -.2 -.2 -.2 .0 .1 .0 -.1 .0 .1 .0 .0 -.1 -.1 -.1 -.1 .0 -.2 -.1 -.2 -.2 -.2 -.1 .1
.0 .0 .0 .0 -.1 .0 .0 -.1 .0 -.2 -.1 -.2 -.3 -.2 -.2 -.2 .0 .0 .0 -.1 -.1 -.1 -.2 -.1 -.2 -.2 -.1 -.2 -.1 -.2 -.2 -.2 -.2 -.2 -.2 .1
.0 .0 .0 .1 .0 .1 .1 .0 .0 -.1 -.1 -.1 -.2 -.1 -.2 -.1 .0 .0 .0 .0 .0 .1 -.1 .0 .0 -.1 -.1 -.2 -.2 -.1 -.2 -.1 -.2 -.1 -.1 .1
.2 .2 .2 .2 .1 .2 .1 .1 .1 .1 .1 .0 .0 .0 .0 .1 .3 .2 .2 .2 .2 .2 .2 .2 .2 .1 .1 .1 .0 .0 .0 .1 .0 .0 .1 .2
.3 .3 .4 .3 .3 .3 .3 .2 .2 .2 .2 .2 .2 .2 .3 .3 .5 .4 .5 .4 .3 .3 .3 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .1 .3
.4 .4 .4 .4 .5 .4 .4 .4 .3 .4 .3 .3 .3 .3 .3 .4 .5 .5 .5 .5 .5 .4 .4 .3 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .2 .3
.4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .4 .4 .4 .4 .3 .3 .4 .4 .4 .4 .4 .5 .4 .4 .3 .3 .3 .3 .3 .3 .2 .3
.2 .2 .3 .3 .3 .3 .3 .3 .3 .2 .2 .2 .2 .3 .3 .3 .3 .3 .3 .3 .4 .5 .5 .4 .2 .2 .4 .5 .3 .4 .4 .2 .2 .2 .2 .2
.3 .3 .3 .4 .4 .4 .5 .5 .5 .4 .4 .3 .3 .2 .2 .3 .3 .3 .3 .4 .4 .5 .6 .6 .6 .6 .5 .5 .4 .4 .4 .3 .3 .4 .3 .3

Figure 48. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2002
Channel: HIRS4 (400 hPa)
NOAA16, using all observations

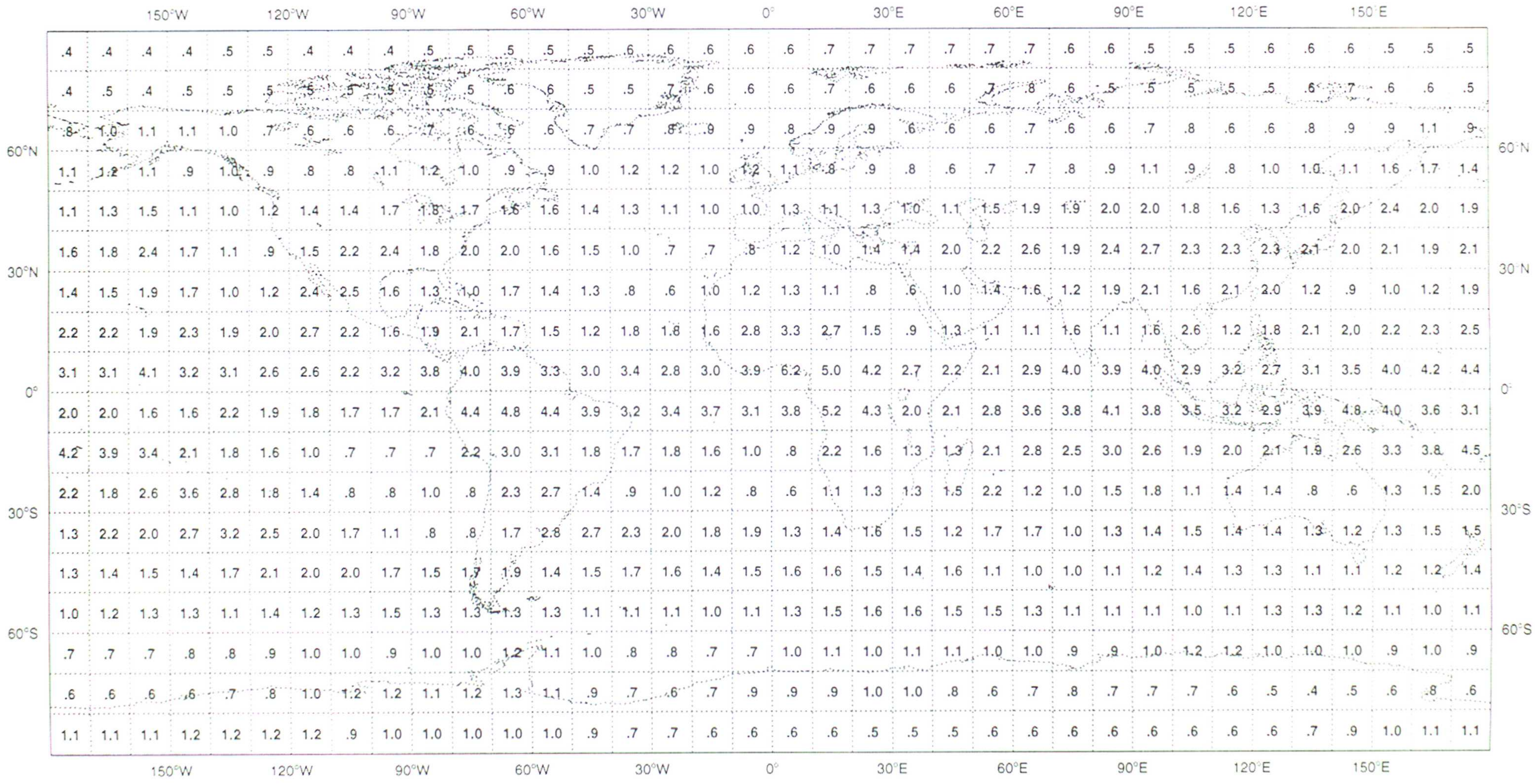
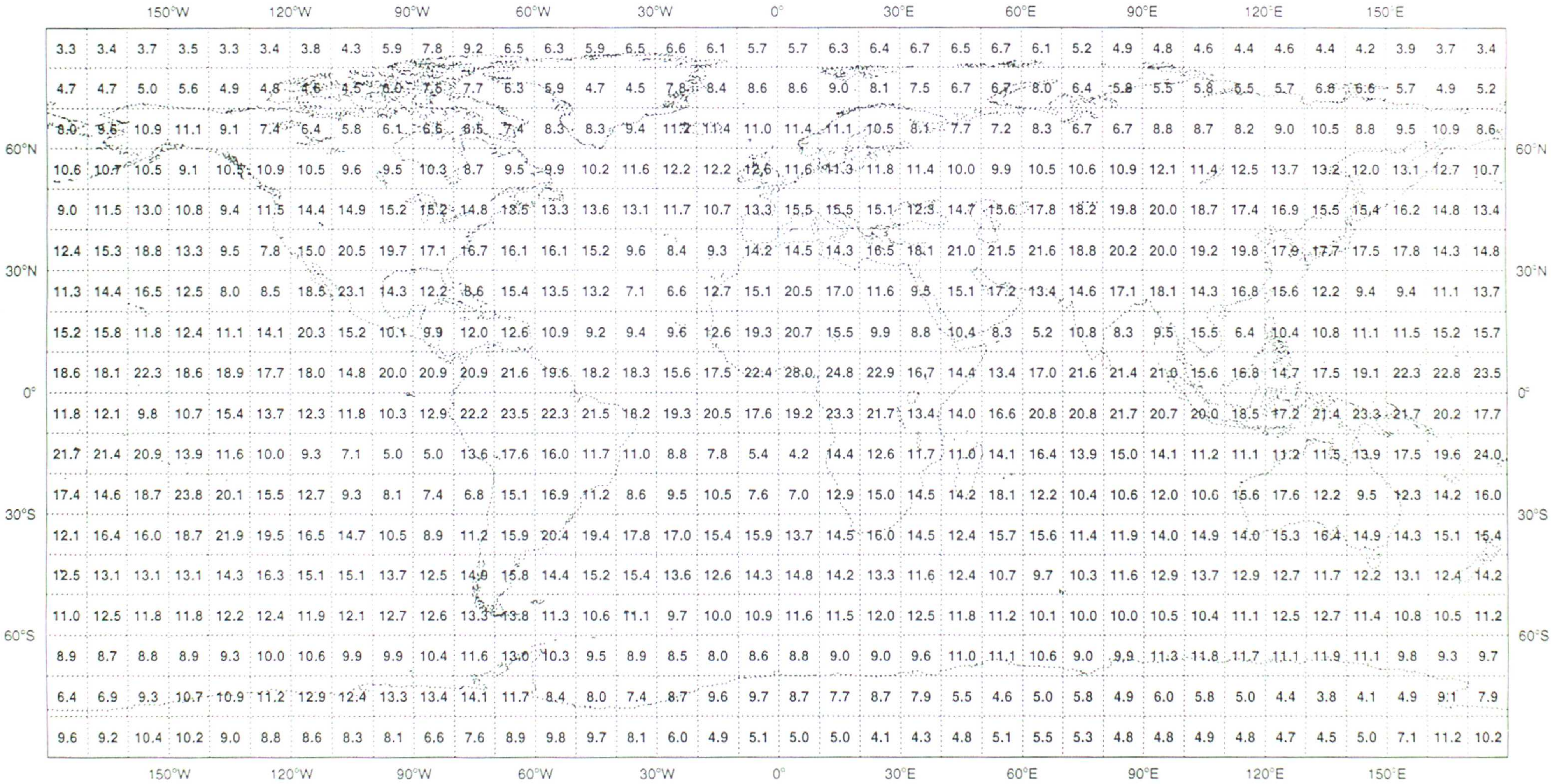

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.4 .4 .4 .4 .5 .5 .4 .4 .4 .5 .5 .5 .5 .5 .6 .6 .6 .6 .6 .7 .7 .7 .7 .7 .7 .6 .6 .5 .5 .5 .6 .6 .6 .5 .5 .5
.4 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .6 .6 .5 .5 .7 .6 .6 .6 .7 .6 .6 .6 .7 .8 .6 .5 .5 .5 .5 .5 .6 .7 .6 .6 .5
.8 1.0 1.1 1.1 1.0 .7 .6 .6 .6 .7 .6 .6 .6 .7 .7 .8 .9 .9 .8 .9 .9 .6 .6 .6 .7 .6 .6 .7 .8 .6 .6 .8 .9 .9 1.1 .9
1.1 1.2 1.1 .9 1.0 .9 .8 .8 1.1 1.2 1.0 .9 .9 1.0 1.2 1.2 1.0 1.2 1.1 .8 .9 .8 .6 .7 .7 .8 .9 1.1 .9 .8 1.0 1.0 1.1 1.6 1.7 1.4
1.1 1.3 1.5 1.1 1.0 1.2 1.4 1.4 1.7 1.8 1.7 1.6 1.6 1.4 1.3 1.1 1.0 1.0 1.3 1.1 1.3 1.0 1.1 1.5 1.9 1.9 2.0 2.0 1.8 1.6 1.3 1.6 2.0 2.4 2.0 1.9
1.6 1.8 2.4 1.7 1.1 .9 1.5 2.2 2.4 1.8 2.0 2.0 1.6 1.5 1.0 .7 .7 .8 1.2 1.0 1.4 1.4 2.0 2.2 2.6 1.9 2.4 2.7 2.3 2.3 2.3 2.1 2.0 2.1 1.9 2.1
1.4 1.5 1.9 1.7 1.0 1.2 2.4 2.5 1.6 1.3 1.0 1.7 1.4 1.3 .8 .6 1.0 1.2 1.3 1.1 .8 .6 1.0 1.4 1.6 1.2 1.9 2.1 1.6 2.1 2.0 1.2 .9 1.0 1.2 1.9
2.2 2.2 1.9 2.3 1.9 2.0 2.7 2.2 1.6 1.9 2.1 1.7 1.5 1.2 1.8 1.8 1.6 2.8 3.3 2.7 1.5 .9 1.3 1.1 1.1 1.6 1.1 1.6 2.6 1.2 1.8 2.1 2.0 2.2 2.3 2.5
3.1 3.1 4.1 3.2 3.1 2.6 2.6 2.2 3.2 3.8 4.0 3.9 3.3 3.0 3.4 2.8 3.0 3.9 6.2 5.0 4.2 2.7 2.2 2.1 2.9 4.0 3.9 4.0 2.9 3.2 2.7 3.1 3.5 4.0 4.2 4.4
2.0 2.0 1.6 1.6 2.2 1.9 1.8 1.7 1.7 2.1 4.4 4.8 4.4 3.9 3.2 3.4 3.7 3.1 3.8 5.2 4.3 2.0 2.1 2.8 3.6 3.8 4.1 3.8 3.5 3.2 2.9 3.9 4.8 4.0 3.6 3.1
4.2 3.9 3.4 2.1 1.8 1.6 1.0 .7 .7 .7 2.2 3.0 3.1 1.8 1.7 1.8 1.6 1.0 .8 2.2 1.6 1.3 1.3 2.1 2.8 2.5 3.0 2.6 1.9 2.0 2.1 1.9 2.6 3.3 3.8 4.5
2.2 1.8 2.6 3.6 2.8 1.8 1.4 .8 .8 1.0 .8 2.3 2.7 1.4 .9 1.0 1.2 .8 .6 1.1 1.3 1.3 1.5 2.2 1.2 1.0 1.5 1.8 1.1 1.4 1.4 .8 .6 1.3 1.5 2.0
1.3 2.2 2.0 2.7 3.2 2.5 2.0 1.7 1.1 .8 .8 1.7 2.8 2.7 2.3 2.0 1.8 1.9 1.3 1.4 1.6 1.5 1.2 1.7 1.7 1.0 1.3 1.4 1.5 1.4 1.4 1.3 1.2 1.3 1.5 1.5
1.3 1.4 1.5 1.4 1.7 2.1 2.0 2.0 1.7 1.5 1.7 1.9 1.4 1.5 1.7 1.6 1.4 1.5 1.6 1.6 1.5 1.4 1.6 1.1 1.0 1.0 1.1 1.2 1.4 1.3 1.3 1.1 1.1 1.2 1.2 1.4
1.0 1.2 1.3 1.3 1.1 1.4 1.2 1.3 1.5 1.3 1.3 1.3 1.3 1.1 1.1 1.1 1.0 1.1 1.3 1.5 1.6 1.6 1.5 1.5 1.3 1.1 1.1 1.1 1.0 1.1 1.3 1.3 1.2 1.1 1.0 1.1
.7 .7 .7 .8 .8 .9 1.0 1.0 .9 1.0 1.0 1.2 1.1 1.0 .8 .8 .7 .7 1.0 1.1 1.0 1.1 1.1 1.0 1.0 .9 .9 1.0 1.2 1.2 1.0 1.0 1.0 .9 1.0 .9
.6 .6 .6 .6 .7 .8 1.0 1.2 1.2 1.1 1.2 1.3 1.1 .9 .7 .6 .7 .9 .9 .9 1.0 1.0 .8 .6 .7 .8 .7 .7 .7 .6 .5 .4 .5 .6 .8 .6
1.1 1.1 1.1 1.2 1.2 1.2 1.2 .9 1.0 1.0 1.0 1.0 1.0 .9 .7 .7 .6 .6 .6 .6 .5 .5 .5 .6 .6 .6 .6 .6 .6 .6 .6 .7 .9 1.0 1.1 1.1

Figure 49. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2002

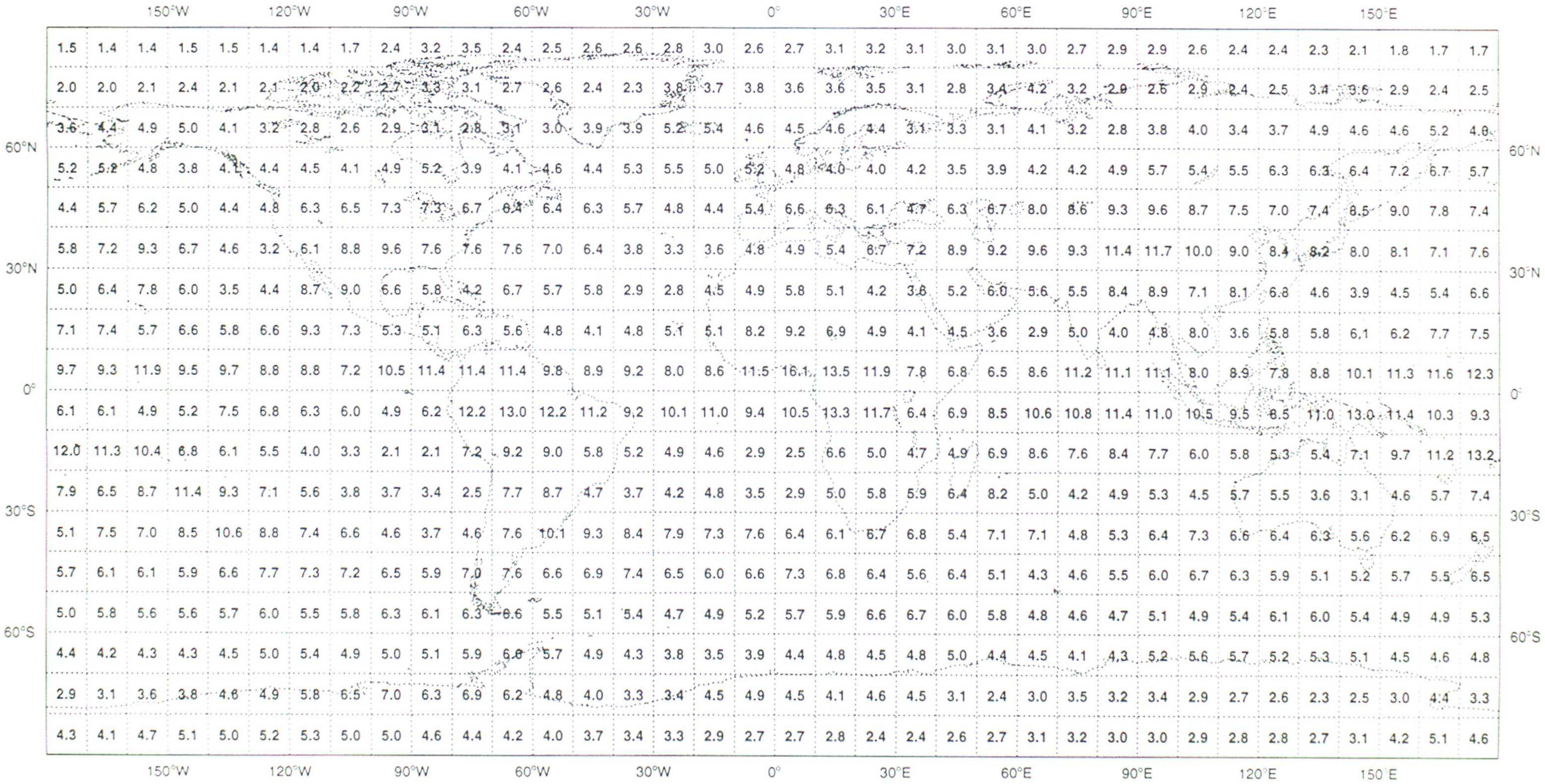
Channel: AMSUA-5 (700 hPa)

NOAA16, using all observations



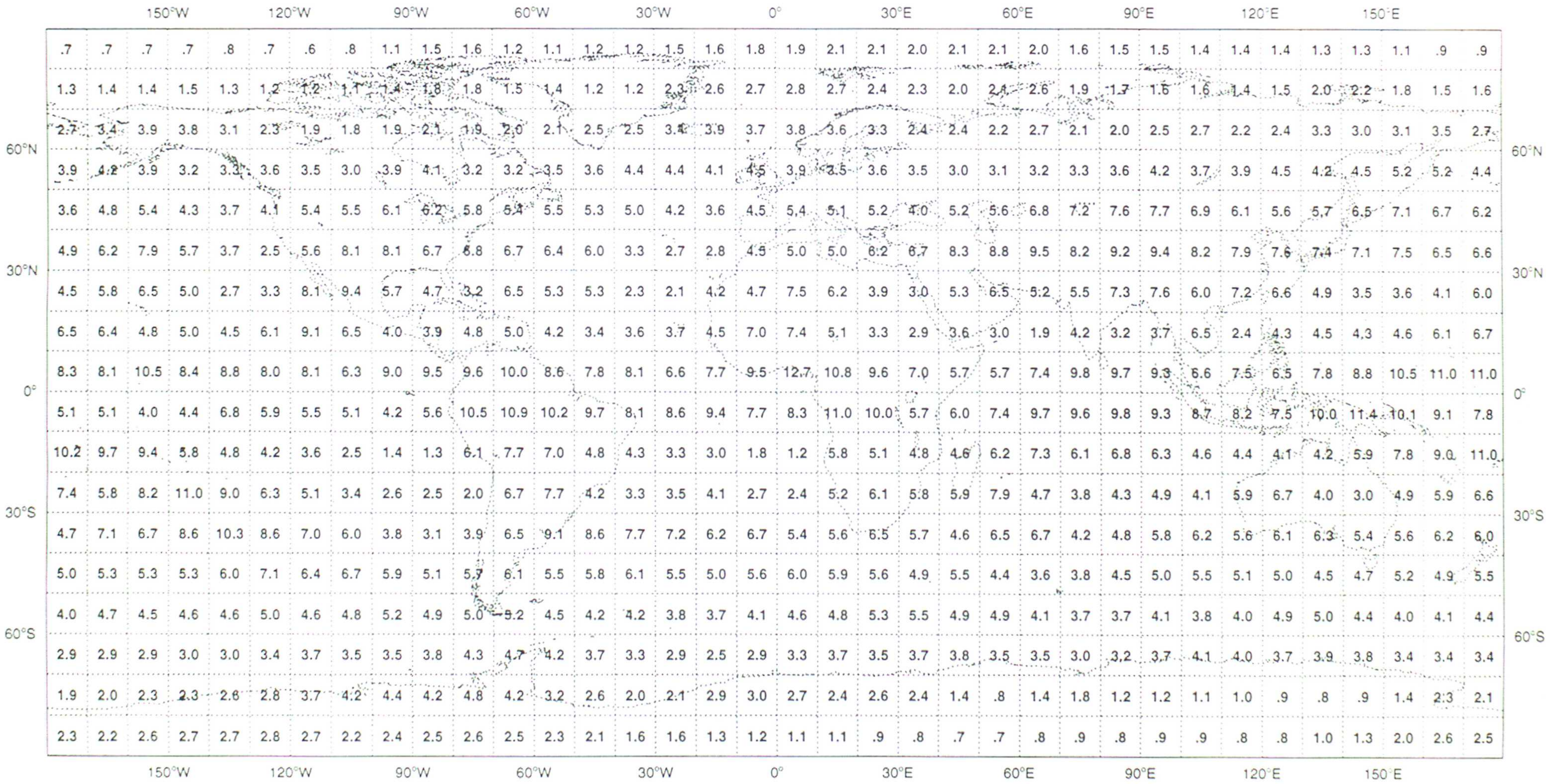
3.3	3.4	3.7	3.5	3.3	3.4	3.8	4.3	5.9	7.8	9.2	6.5	6.3	5.9	6.5	6.6	6.1	5.7	5.7	6.3	6.4	6.7	6.5	6.7	6.1	5.2	4.9	4.8	4.6	4.4	4.6	4.4	4.2	3.9	3.7	3.4
4.7	4.7	5.0	5.6	4.9	4.8	4.6	4.5	6.0	7.5	7.7	6.3	5.9	4.7	4.5	7.8	8.4	8.6	8.6	9.0	8.1	7.5	6.7	6.7	8.0	6.4	5.8	5.5	5.8	5.5	5.7	6.8	6.6	5.7	4.9	5.2
8.0	9.6	10.9	11.1	9.1	7.4	6.4	5.8	6.1	6.6	6.5	7.4	8.3	8.3	9.4	11.2	11.4	11.0	11.4	11.1	10.5	8.1	7.7	7.2	8.3	6.7	6.7	8.8	8.7	8.2	9.0	10.5	8.8	9.5	10.9	8.6
10.6	10.7	10.5	9.1	10.5	10.9	10.5	9.6	9.5	10.3	8.7	9.5	9.9	10.2	11.6	12.2	12.2	12.6	11.6	11.3	11.8	11.4	10.0	9.9	10.5	10.6	10.9	12.1	11.4	12.5	13.7	13.2	12.0	13.1	12.7	10.7
9.0	11.5	13.0	10.8	9.4	11.5	14.4	14.9	15.2	15.2	14.8	18.5	13.3	13.6	13.1	11.7	10.7	13.3	15.5	15.5	15.1	12.3	14.7	15.6	17.8	18.2	19.8	20.0	18.7	17.4	16.9	15.5	15.4	16.2	14.8	13.4
12.4	15.3	18.8	13.3	9.5	7.8	15.0	20.5	19.7	17.1	16.7	16.1	16.1	15.2	9.6	8.4	9.3	14.2	14.5	14.3	16.5	18.1	21.0	21.5	21.6	18.8	20.2	20.0	19.2	19.8	17.9	17.7	17.5	17.8	14.3	14.8
11.3	14.4	16.5	12.5	8.0	8.5	18.5	23.1	14.3	12.2	8.6	15.4	13.5	13.2	7.1	6.6	12.7	15.1	20.5	17.0	11.6	9.5	15.1	17.2	13.4	14.6	17.1	18.1	14.3	16.8	15.6	12.2	9.4	9.4	11.1	13.7
15.2	15.8	11.8	12.4	11.1	14.1	20.3	15.2	10.1	9.9	12.0	12.6	10.9	9.2	9.4	9.6	12.6	19.3	20.7	15.5	9.9	8.8	10.4	8.3	5.2	10.8	8.3	9.5	15.5	6.4	10.4	10.8	11.1	11.5	15.2	15.7
18.6	18.1	22.3	18.6	18.9	17.7	18.0	14.8	20.0	20.9	20.9	21.6	19.6	18.2	18.3	15.6	17.5	22.4	28.0	24.8	22.9	16.7	14.4	13.4	17.0	21.6	21.4	21.0	15.6	16.8	14.7	17.5	19.1	22.3	22.8	23.5
11.8	12.1	9.8	10.7	15.4	13.7	12.3	11.8	10.3	12.9	22.2	23.5	22.3	21.5	18.2	19.3	20.5	17.6	19.2	23.3	21.7	13.4	14.0	16.6	20.8	20.8	21.7	20.7	20.0	18.5	17.2	21.4	23.3	21.7	20.2	17.7
21.7	21.4	20.9	13.9	11.6	10.0	9.3	7.1	5.0	5.0	13.6	17.6	16.0	11.7	11.0	8.8	7.8	5.4	4.2	14.4	12.6	11.7	11.0	14.1	16.4	13.9	15.0	14.1	11.2	11.1	11.2	11.5	13.9	17.5	19.6	24.0
17.4	14.6	18.7	23.8	20.1	15.5	12.7	9.3	8.1	7.4	6.8	15.1	16.9	11.2	8.6	9.5	10.5	7.6	7.0	12.9	15.0	14.5	14.2	18.1	12.2	10.4	10.6	12.0	10.6	15.6	17.6	12.2	9.5	12.3	14.2	16.0
12.1	16.4	16.0	18.7	21.9	19.5	16.5	14.7	10.5	8.9	11.2	15.9	20.4	19.4	17.8	17.0	15.4	15.9	13.7	14.5	16.0	14.5	12.4	15.7	15.6	11.4	11.9	14.0	14.9	14.0	15.3	16.4	14.9	14.3	15.1	15.4
12.5	13.1	13.1	13.1	14.3	16.3	15.1	15.1	13.7	12.5	14.9	15.8	14.4	15.2	15.4	13.6	12.6	14.3	14.8	14.2	13.3	11.6	12.4	10.7	9.7	10.3	11.6	12.9	13.7	12.9	12.7	11.7	12.2	13.1	12.4	14.2
11.0	12.5	11.8	11.8	12.2	12.4	11.9	12.1	12.7	12.6	13.3	13.8	11.3	10.6	11.1	9.7	10.0	10.9	11.6	11.5	12.0	12.5	11.8	11.2	10.1	10.0	10.0	10.5	10.4	11.1	12.5	12.7	11.4	10.8	10.5	11.2
8.9	8.7	8.8	8.9	9.3	10.0	10.6	9.9	9.9	10.4	11.6	13.0	10.3	9.5	8.9	8.5	8.0	8.6	8.8	9.0	9.0	9.6	11.0	11.1	10.6	9.0	9.9	11.3	11.8	11.7	11.1	11.9	11.1	9.8	9.3	9.7
6.4	6.9	9.3	10.7	10.9	11.2	12.9	12.4	13.3	13.4	14.1	11.7	8.4	8.0	7.4	8.7	9.6	9.7	8.7	7.7	8.7	7.9	5.5	4.6	5.0	5.8	4.9	6.0	5.8	5.0	4.4	3.8	4.1	4.9	9.1	7.9
9.6	9.2	10.4	10.2	9.0	8.8	8.6	8.3	8.1	6.6	7.6	8.9	9.8	9.7	8.1	6.0	4.9	5.1	5.0	5.0	4.1	4.3	4.8	5.1	5.5	5.3	4.8	4.8	4.9	4.8	4.7	4.5	5.0	7.1	11.2	10.2

Figure 50. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2002
Channel: AMSUA-5 (700 hPa)
NOAA16, using all observations

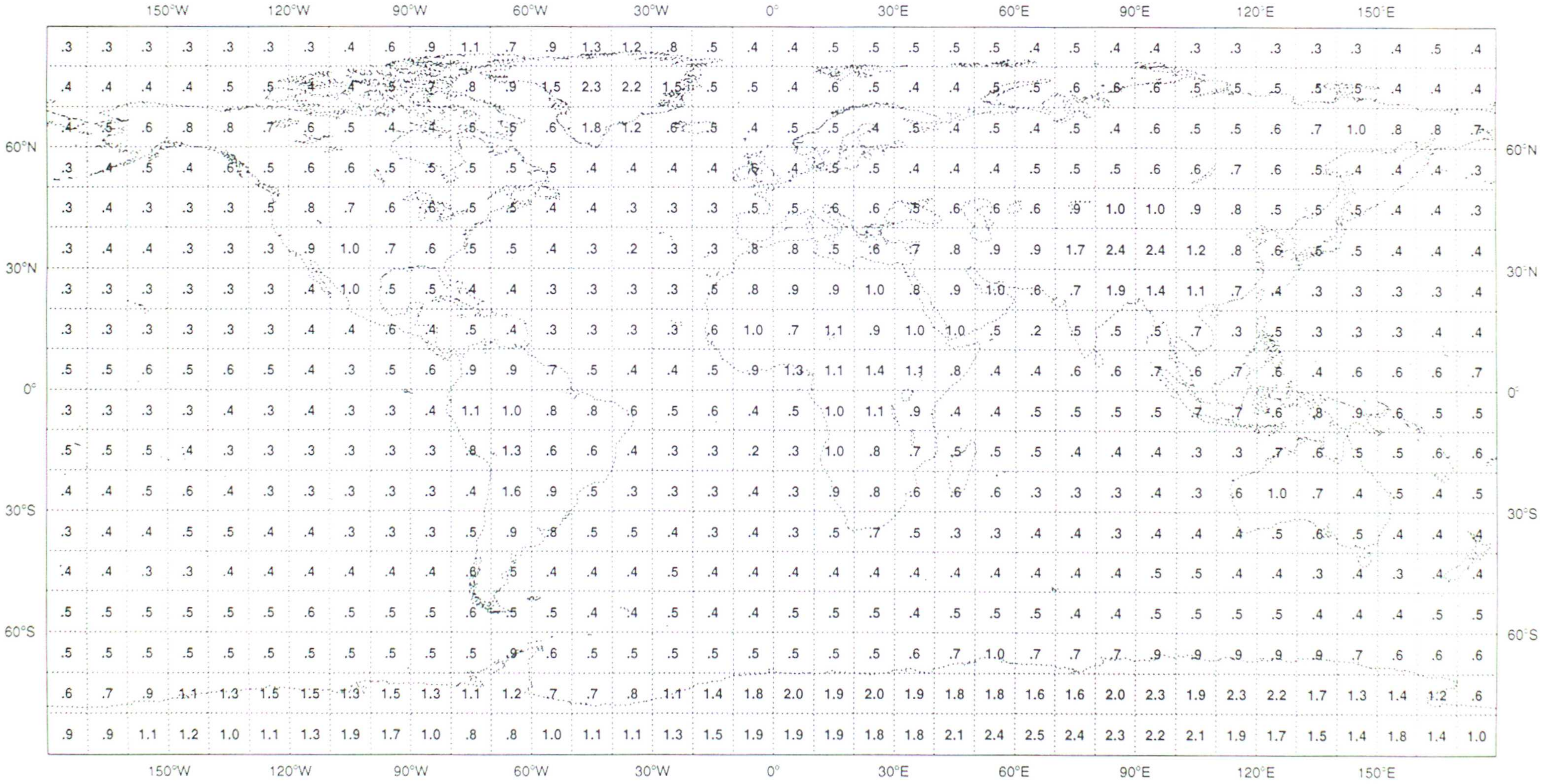


1.5	1.4	1.4	1.5	1.5	1.4	1.4	1.7	2.4	3.2	3.5	2.4	2.5	2.6	2.6	2.8	3.0	2.6	2.7	3.1	3.2	3.1	3.0	3.1	3.0	2.7	2.9	2.9	2.6	2.4	2.4	2.3	2.1	1.8	1.7	1.7
2.0	2.0	2.1	2.4	2.1	2.1	2.0	2.2	2.7	3.3	3.1	2.7	2.6	2.4	2.3	3.8	3.7	3.8	3.6	3.6	3.5	3.1	2.8	3.4	4.2	3.2	2.9	2.6	2.9	2.4	2.5	3.4	3.6	2.9	2.4	2.5
3.6	4.4	4.9	5.0	4.1	3.2	2.8	2.6	2.9	3.1	2.8	3.1	3.0	3.9	3.9	5.2	5.4	4.6	4.5	4.6	4.4	3.1	3.3	3.1	4.1	3.2	2.8	3.8	4.0	3.4	3.7	4.9	4.6	4.6	5.2	4.8
5.2	5.2	4.8	3.8	4.1	4.4	4.5	4.1	4.9	5.2	3.9	4.1	4.6	4.4	5.3	5.5	5.0	5.2	4.8	4.0	4.0	4.2	3.5	3.9	4.2	4.2	4.9	5.7	5.4	5.5	6.3	6.3	6.4	7.2	6.7	5.7
4.4	5.7	6.2	5.0	4.4	4.8	6.3	6.5	7.3	7.3	6.7	6.4	6.4	6.3	5.7	4.8	4.4	5.4	6.6	6.3	6.1	4.7	6.3	6.7	8.0	8.6	9.3	9.6	8.7	7.5	7.0	7.4	8.5	9.0	7.8	7.4
5.8	7.2	9.3	6.7	4.6	3.2	6.1	8.8	9.6	7.6	7.6	7.6	7.0	6.4	3.8	3.3	3.6	4.8	4.9	5.4	6.7	7.2	8.9	9.2	9.6	9.3	11.4	11.7	10.0	9.0	8.4	8.2	8.0	8.1	7.1	7.6
5.0	6.4	7.8	6.0	3.5	4.4	8.7	9.0	6.6	5.8	4.2	6.7	5.7	5.8	2.9	2.8	4.5	4.9	5.8	5.1	4.2	3.6	5.2	6.0	5.6	5.5	8.4	8.9	7.1	8.1	6.8	4.6	3.9	4.5	5.4	6.6
7.1	7.4	5.7	6.6	5.8	6.6	9.3	7.3	5.3	5.1	6.3	5.6	4.8	4.1	4.8	5.1	5.1	8.2	9.2	6.9	4.9	4.1	4.5	3.6	2.9	5.0	4.0	4.8	8.0	3.6	5.8	5.8	6.1	6.2	7.7	7.5
9.7	9.3	11.9	9.5	9.7	8.8	8.8	7.2	10.5	11.4	11.4	11.4	9.8	8.9	9.2	8.0	8.6	11.5	16.1	13.5	11.9	7.8	6.8	6.5	8.6	11.2	11.1	11.1	8.0	8.9	7.8	8.8	10.1	11.3	11.6	12.3
6.1	6.1	4.9	5.2	7.5	6.8	6.3	6.0	4.9	6.2	12.2	13.0	12.2	11.2	9.2	10.1	11.0	9.4	10.5	13.3	11.7	6.4	6.9	8.5	10.6	10.8	11.4	11.0	10.5	9.5	8.5	11.0	13.0	11.4	10.3	9.3
12.0	11.3	10.4	6.8	6.1	5.5	4.0	3.3	2.1	2.1	7.2	9.2	9.0	5.8	5.2	4.9	4.6	2.9	2.5	6.6	5.0	4.7	4.9	6.9	8.6	7.6	8.4	7.7	6.0	5.8	5.3	5.4	7.1	9.7	11.2	13.2
7.9	6.5	8.7	11.4	9.3	7.1	5.6	3.8	3.7	3.4	2.5	7.7	8.7	4.7	3.7	4.2	4.8	3.5	2.9	5.0	5.8	5.9	6.4	8.2	5.0	4.2	4.9	5.3	4.5	5.7	5.5	3.6	3.1	4.6	5.7	7.4
5.1	7.5	7.0	8.5	10.6	8.8	7.4	6.6	4.6	3.7	4.6	7.6	10.1	9.3	8.4	7.9	7.3	7.6	6.4	6.1	6.7	6.8	5.4	7.1	7.1	4.8	5.3	6.4	7.3	6.6	6.4	6.3	5.6	6.2	6.9	6.5
5.7	6.1	6.1	5.9	6.6	7.7	7.3	7.2	6.5	5.9	7.0	7.6	6.6	6.9	7.4	6.5	6.0	6.6	7.3	6.8	6.4	5.6	6.4	5.1	4.3	4.6	5.5	6.0	6.7	6.3	5.9	5.1	5.2	5.7	5.5	6.5
5.0	5.8	5.6	5.6	5.7	6.0	5.5	5.8	6.3	6.1	6.3	6.6	5.5	5.1	5.4	4.7	4.9	5.2	5.7	5.9	6.6	6.7	6.0	5.8	4.8	4.6	4.7	5.1	4.9	5.4	6.1	6.0	5.4	4.9	4.9	5.3
4.4	4.2	4.3	4.3	4.5	5.0	5.4	4.9	5.0	5.1	5.9	6.8	5.7	4.9	4.3	3.8	3.5	3.9	4.4	4.8	4.5	4.8	5.0	4.4	4.5	4.1	4.3	5.2	5.6	5.7	5.2	5.3	5.1	4.5	4.6	4.8
2.9	3.1	3.6	3.8	4.6	4.9	5.8	6.5	7.0	6.3	6.9	6.2	4.8	4.0	3.3	3.4	4.5	4.9	4.5	4.1	4.6	4.5	3.1	2.4	3.0	3.5	3.2	3.4	2.9	2.7	2.6	2.3	2.5	3.0	4.4	3.3
4.3	4.1	4.7	5.1	5.0	5.2	5.3	5.0	5.0	4.6	4.4	4.2	4.0	3.7	3.4	3.3	2.9	2.7	2.7	2.8	2.4	2.4	2.6	2.7	3.1	3.2	3.0	3.0	2.9	2.8	2.8	2.7	3.1	4.2	5.1	4.6

Figure 51. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2002
Channel: AMSUA-7 (300 hPa)
NOAA16, using all observations



.7	.7	.7	.7	.8	.7	.6	.8	1.1	1.5	1.6	1.2	1.1	1.2	1.2	1.5	1.6	1.8	1.9	2.1	2.1	2.0	2.1	2.1	2.0	1.6	1.5	1.5	1.4	1.4	1.4	1.3	1.3	1.1	.9	.9
1.3	1.4	1.4	1.5	1.3	1.2	1.2	1.1	1.4	1.8	1.8	1.5	1.4	1.2	1.2	2.3	2.6	2.7	2.8	2.7	2.4	2.3	2.0	2.4	2.6	1.9	1.7	1.6	1.6	1.4	1.5	2.0	2.2	1.8	1.5	1.6
2.7	3.4	3.9	3.8	3.1	2.3	1.9	1.8	1.9	2.1	1.9	2.0	2.1	2.5	2.5	3.4	3.9	3.7	3.8	3.6	3.3	2.4	2.4	2.2	2.7	2.1	2.0	2.5	2.7	2.2	2.4	3.3	3.0	3.1	3.5	2.7
3.9	4.2	3.9	3.2	3.3	3.6	3.5	3.0	3.9	4.1	3.2	3.2	3.5	3.6	4.4	4.4	4.1	4.5	3.9	3.5	3.6	3.5	3.0	3.1	3.2	3.3	3.6	4.2	3.7	3.9	4.5	4.2	4.5	5.2	5.2	4.4
3.6	4.8	5.4	4.3	3.7	4.1	5.4	5.5	6.1	6.2	5.8	5.4	5.5	5.3	5.0	4.2	3.6	4.5	5.4	5.1	5.2	4.0	5.2	5.6	6.8	7.2	7.6	7.7	6.9	6.1	5.6	5.7	6.5	7.1	6.7	6.2
4.9	6.2	7.9	5.7	3.7	2.5	5.6	8.1	8.1	6.7	6.8	6.7	6.4	6.0	3.3	2.7	2.8	4.5	5.0	5.0	6.2	6.7	8.3	8.8	9.5	8.2	9.2	9.4	8.2	7.9	7.6	7.4	7.1	7.5	6.5	6.6
4.5	5.8	6.5	5.0	2.7	3.3	8.1	9.4	5.7	4.7	3.2	6.5	5.3	5.3	2.3	2.1	4.2	4.7	7.5	6.2	3.9	3.0	5.3	6.5	5.2	5.5	7.3	7.6	6.0	7.2	6.6	4.9	3.5	3.6	4.1	6.0
6.5	6.4	4.8	5.0	4.5	6.1	9.1	6.5	4.0	3.9	4.8	5.0	4.2	3.4	3.6	3.7	4.5	7.0	7.4	5.1	3.3	2.9	3.6	3.0	1.9	4.2	3.2	3.7	6.5	2.4	4.3	4.5	4.3	4.6	6.1	6.7
8.3	8.1	10.5	8.4	8.8	8.0	8.1	6.3	9.0	9.5	9.6	10.0	8.6	7.8	8.1	6.6	7.7	9.5	12.7	10.8	9.6	7.0	5.7	5.7	7.4	9.8	9.7	9.3	6.6	7.5	6.5	7.8	8.8	10.5	11.0	11.0
5.1	5.1	4.0	4.4	6.8	5.9	5.5	5.1	4.2	5.6	10.5	10.9	10.2	9.7	8.1	8.6	9.4	7.7	8.3	11.0	10.0	5.7	6.0	7.4	9.7	9.6	9.8	9.3	8.7	8.2	7.5	10.0	11.4	10.1	9.1	7.8
10.2	9.7	9.4	5.8	4.8	4.2	3.6	2.5	1.4	1.3	6.1	7.7	7.0	4.8	4.3	3.3	3.0	1.8	1.2	5.8	5.1	4.8	4.6	6.2	7.3	6.1	6.8	6.3	4.6	4.4	4.1	4.2	5.9	7.8	9.0	11.0
7.4	5.8	8.2	11.0	9.0	6.3	5.1	3.4	2.6	2.5	2.0	6.7	7.7	4.2	3.3	3.5	4.1	2.7	2.4	5.2	6.1	5.8	5.9	7.9	4.7	3.8	4.3	4.9	4.1	5.9	6.7	4.0	3.0	4.9	5.9	6.6
4.7	7.1	6.7	8.6	10.3	8.6	7.0	6.0	3.8	3.1	3.9	6.5	9.1	8.6	7.7	7.2	6.2	6.7	5.4	5.6	6.5	5.7	4.6	6.5	6.7	4.2	4.8	5.8	6.2	5.6	6.1	6.3	5.4	5.6	6.2	6.0
5.0	5.3	5.3	5.3	6.0	7.1	6.4	6.7	5.9	5.1	5.7	6.1	5.5	5.8	6.1	5.5	5.0	5.6	6.0	5.9	5.6	4.9	5.5	4.4	3.6	3.8	4.5	5.0	5.5	5.1	5.0	4.5	4.7	5.2	4.9	5.5
4.0	4.7	4.5	4.6	4.6	5.0	4.6	4.8	5.2	4.9	5.0	5.2	4.5	4.2	4.2	3.8	3.7	4.1	4.6	4.8	5.3	5.5	4.9	4.9	4.1	3.7	3.7	4.1	3.8	4.0	4.9	5.0	4.4	4.0	4.1	4.4
2.9	2.9	2.9	3.0	3.0	3.4	3.7	3.5	3.5	3.8	4.3	4.7	4.2	3.7	3.3	2.9	2.5	2.9	3.3	3.7	3.5	3.7	3.8	3.5	3.5	3.0	3.2	3.7	4.1	4.0	3.7	3.9	3.8	3.4	3.4	3.4
1.9	2.0	2.3	2.3	2.6	2.8	3.7	4.2	4.4	4.2	4.8	4.2	3.2	2.6	2.0	2.1	2.9	3.0	2.7	2.4	2.6	2.4	1.4	.8	1.4	1.8	1.2	1.2	1.1	1.0	.9	.8	.9	1.4	2.3	2.1
2.3	2.2	2.6	2.7	2.7	2.8	2.7	2.2	2.4	2.5	2.6	2.5	2.3	2.1	1.6	1.6	1.3	1.2	1.1	1.1	.9	.8	.7	.7	.8	.9	.8	.9	.9	.8	.8	1.0	1.3	2.0	2.6	2.5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120°E
150°E
60°N
30°N
0°
30°S
60°S
.3 .3 .3 .3 .3 .3 .3 .4 .6 .9 1.1 .7 .9 1.3 1.2 .8 .5 .4 .4 .5 .5 .5 .5 .5 .4 .5 .4 .4 .3 .3 .3 .3 .3 .4 .5 .4
.4 .4 .4 .4 .5 .5 .4 .4 .5 .7 .8 .9 1.5 2.3 2.2 1.5 .5 .5 .4 .6 .5 .4 .4 .5 .5 .6 .6 .6 .5 .5 .5 .5 .5 .4 .4 .4
.4 .5 .6 .8 .8 .7 .6 .5 .4 .4 .5 .5 .6 1.8 1.2 .6 .5 .4 .5 .5 .4 .5 .4 .5 .4 .5 .4 .6 .5 .5 .6 .7 1.0 .8 .8 .7
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.3 .4 .3 .3 .3 .5 .8 .7 .6 .6 .5 .5 .4 .4 .3 .3 .3 .5 .5 .6 .6 .5 .6 .6 .6 .9 1.0 1.0 .9 .8 .5 .5 .5 .4 .4 .3
.3 .4 .4 .3 .3 .3 .9 1.0 .7 .6 .5 .5 .4 .3 .2 .3 .3 .8 .8 .5 .6 .7 .8 .9 .9 1.7 2.4 2.4 1.2 .8 .6 .5 .5 .4 .4 .4
.3 .3 .3 .3 .3 .3 .4 1.0 .5 .5 .4 .4 .3 .3 .3 .3 .5 .8 .9 .9 1.0 .8 .9 1.0 .6 .7 1.9 1.4 1.1 .7 .4 .3 .3 .3 .3 .4
.3 .3 .3 .3 .3 .3 .4 .4 .6 .4 .5 .4 .3 .3 .3 .3 .6 1.0 .7 1.1 .9 1.0 1.0 .5 .2 .5 .5 .5 .7 .3 .5 .3 .3 .3 .4 .4
.5 .5 .6 .5 .6 .5 .4 .3 .5 .6 .9 .9 .7 .5 .4 .4 .5 .9 1.3 1.1 1.4 1.1 .8 .4 .4 .6 .6 .7 .6 .7 .6 .4 .6 .6 .6 .7
.3 .3 .3 .3 .4 .3 .4 .3 .3 .4 1.1 1.0 .8 .8 .6 .5 .6 .4 .5 1.0 1.1 .9 .4 .4 .5 .5 .5 .5 .7 .7 .6 .8 .9 .6 .5 .5
.5 .5 .5 .4 .3 .3 .3 .3 .3 .3 .8 1.3 .6 .6 .4 .3 .3 .2 .3 1.0 .8 .7 .5 .5 .5 .4 .4 .4 .3 .3 .7 .6 .5 .5 .6 .6
.4 .4 .5 .6 .4 .3 .3 .3 .3 .3 .4 1.6 .9 .5 .3 .3 .3 .4 .3 .9 .8 .6 .6 .6 .3 .3 .3 .4 .3 .6 1.0 .7 .4 .5 .4 .5
.3 .4 .4 .5 .5 .4 .4 .3 .3 .3 .5 .9 .8 .5 .5 .4 .3 .4 .3 .5 .7 .5 .3 .3 .4 .4 .3 .4 .4 .4 .5 .6 .5 .4 .4 .4
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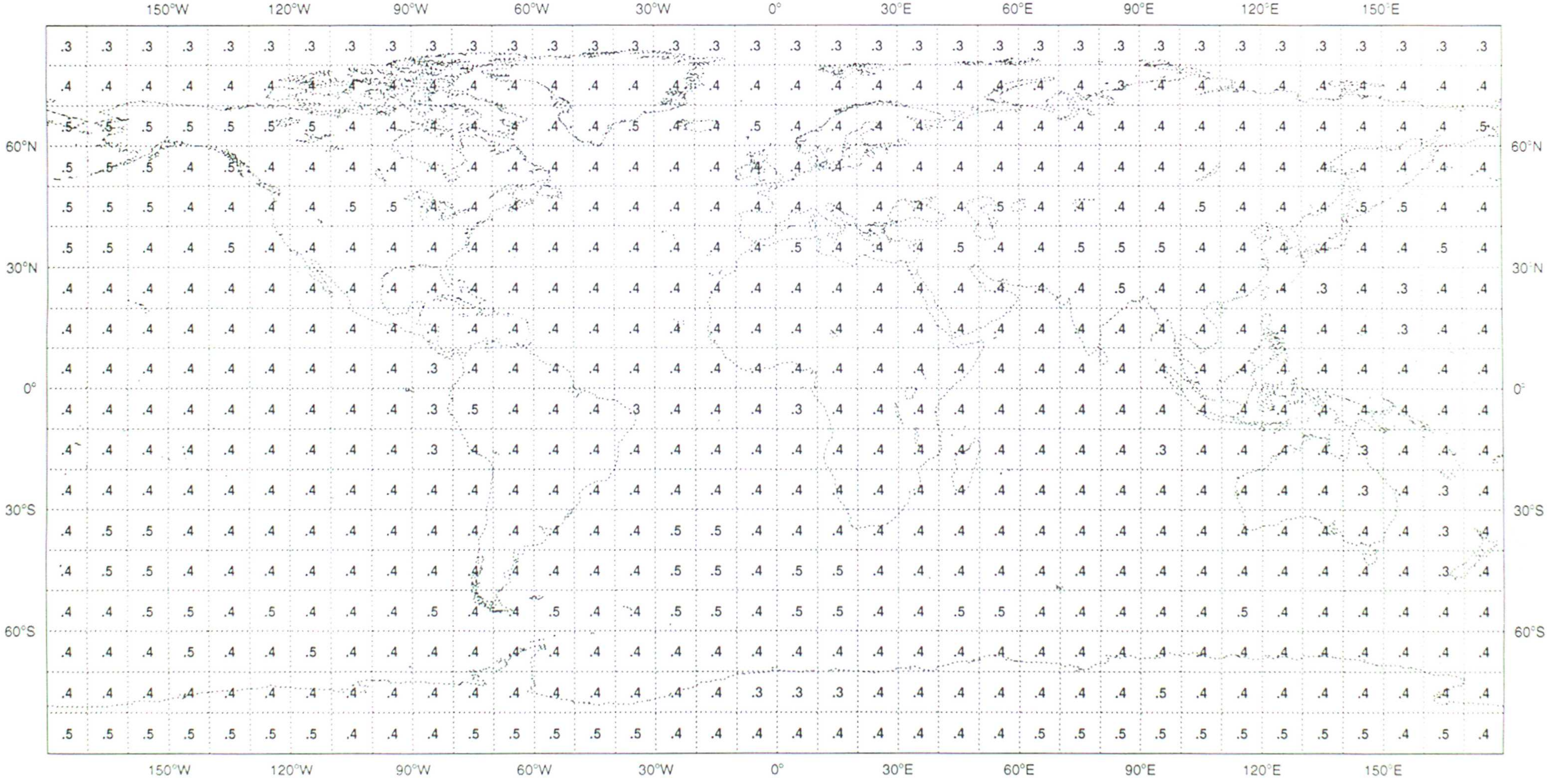
.5 .5 .5 .5 .5 .5 .6 .5 .5 .5 .6 .5 .5 .4 .4 .5 .4 .4 .5 .5 .5 .4 .5 .5 .5 .4 .4 .5 .5 .5 .5 .4 .4 .4 .5 .5
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .9 .6 .5 .5 .5 .5 .5 .5 .5 .5 .6 .7 1.0 .7 .7 .7 .9 .9 .9 .9 .9 .7 .6 .6 .6
.6 .7 .9 1.1 1.3 1.5 1.5 1.3 1.5 1.3 1.1 1.2 .7 .7 .8 1.1 1.4 1.8 2.0 1.9 2.0 1.9 1.8 1.8 1.6 1.6 2.0 2.3 1.9 2.3 2.2 1.7 1.3 1.4 1.2 .6
.9 .9 1.1 1.2 1.0 1.1 1.3 1.9 1.7 1.0 .8 .8 1.0 1.1 1.1 1.3 1.5 1.9 1.9 1.9 1.8 1.8 2.1 2.4 2.5 2.4 2.3 2.2 2.1 1.9 1.7 1.5 1.4 1.8 1.4 1.0

Figure 52. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2002
Channel: AMSUA-7 (300 hPa)
NOAA16, using all observations

Figure 53. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2002
Channel: AMSUA-9 (100 hPa)
NOAA16, using all observations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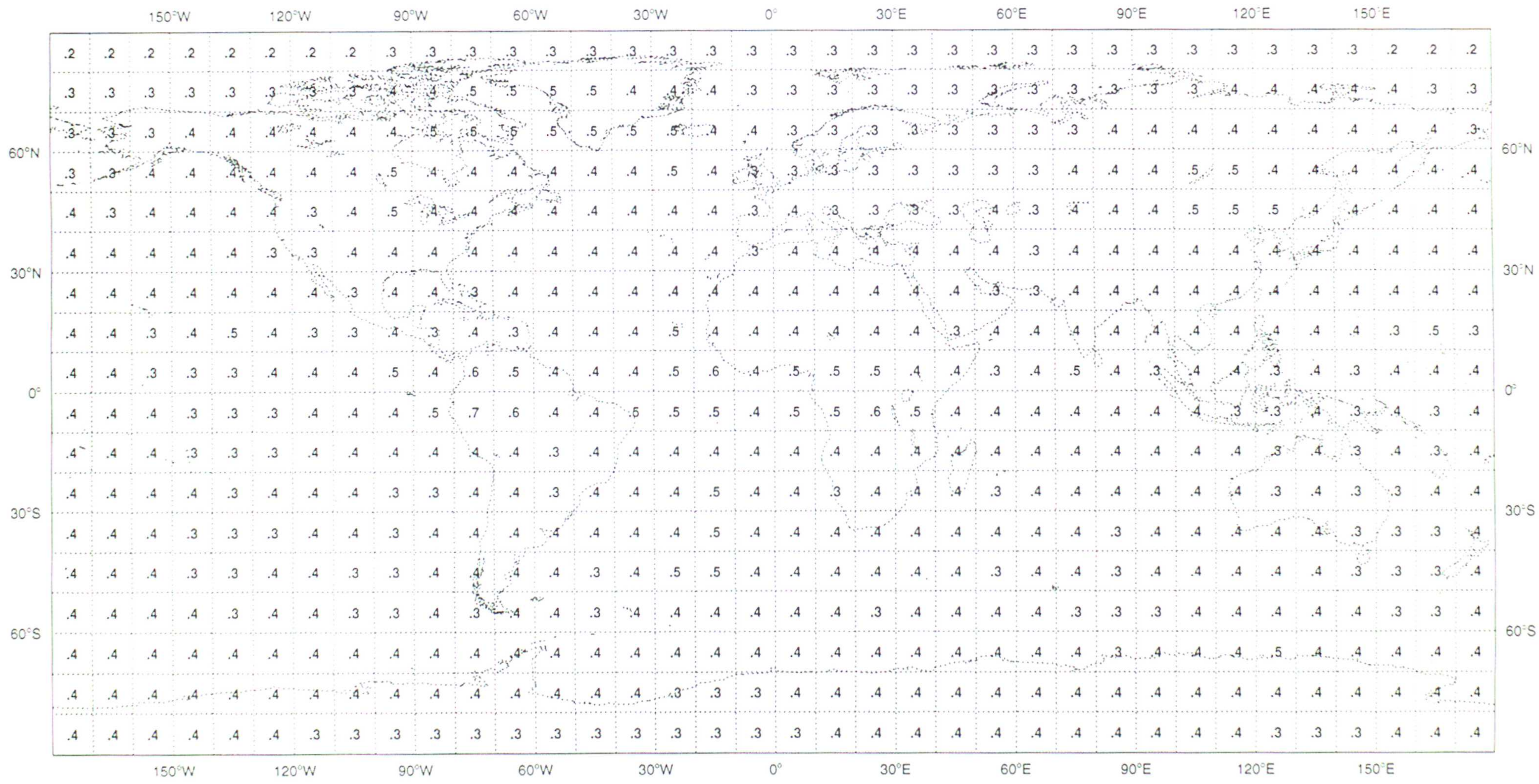
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 54. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2002
Channel: AMSUA-9 (100 hPa)
NOAA16, using all observations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60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
DATA TYPE:- DRIFTER
MONITORING CENTRE: BRACKNELL
MONTH: April 2002

Monitoring procedures		
Period		:One calendar month.
Data monitored		:Reports from each unique identifier for drifting buoy.
Area monitored		:10°N - 80°N, 85°W - 0°W
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:All hours combined.
Elements monitored		:Mean sea-level pressure (hPa) :Wind speed (m s^{-1}) :Wind direction (degrees)
Parameters monitored		
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. A positive bias indicates the wind observation is veered to the background**
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors
GROSS ERROR LIMITS	:15 hPa (pressure) :25 m s^{-1} (Vector Wind)	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
13503	23.7	-25.4	ALL	P	SUR	126	0	0	0.7	0.5	0.9
24778	47.4	-10.5	ALL	P	SUR	1	0	0	0.0	-0.3	0.3
25552	77.4	-13.3	ALL	P	SUR	467	1	0	1.5	0.5	1.6
26553	58.5	-28.4	ALL	P	SUR	1	0	0	0.0	-0.1	0.1
34552	64.6	-34.1	ALL	P	SUR	1	0	0	0.0	1.2	1.2
41501	15.8	-55.3	ALL	P	SUR	150	0	0	4.0	3.2	5.1
41523	30.4	-43.4	ALL	P	SUR	383	0	0	0.6	0.2	0.7
41528	10.8	-49.8	ALL	P	SUR	136	0	0	0.5	-0.1	0.5
41552	20.7	-52.2	ALL	P	SUR	627	0	0	0.5	-1.1	1.2
41554	22.8	-72.3	ALL	P	SUR	19	0	0	0.3	-1.0	1.1
41556	16.0	-71.6	ALL	P	SUR	616	0	0	0.5	-0.6	0.8
41557	21.3	-70.0	ALL	P	SUR	635	0	0	0.5	-0.2	0.6
41559	21.3	-68.6	ALL	P	SUR	628	0	0	0.5	-0.5	0.7
41560	16.5	-61.3	ALL	P	SUR	526	0	0	0.5	-0.8	0.9
41561	21.6	-54.9	ALL	P	SUR	608	0	0	0.4	-0.7	0.8
41563	19.7	-49.7	ALL	P	SUR	623	0	0	0.5	-0.4	0.6
41625	21.0	-48.0	ALL	P	SUR	144	0	0	0.5	0.4	0.6
41645	30.1	-78.0	ALL	P	SUR	615	0	0	0.5	0.2	0.5
41647	30.5	-70.3	ALL	P	SUR	605	0	0	0.5	-0.1	0.5
41648	26.5	-71.9	ALL	P	SUR	619	0	0	0.5	0.2	0.5
41650	29.5	-66.5	ALL	P	SUR	615	0	0	0.5	0.3	0.6
41651	24.3	-75.4	ALL	P	SUR	636	0	0	0.5	0.3	0.6
41652	29.2	-63.6	ALL	P	SUR	615	0	0	0.6	-0.2	0.6
41656	32.0	-80.7	ALL	P	SUR	644	1	0	0.7	0.3	0.7
41657	39.4	-36.9	ALL	P	SUR	478	2	0	1.2	-0.4	1.3
41658	36.3	-44.7	ALL	P	SUR	610	0	0	0.7	-0.7	1.0
41659	39.2	-36.1	ALL	P	SUR	652	0	0	0.9	0.8	1.2
42533	38.0	-67.8	ALL	P	SUR	616	1	0	0.8	-0.7	1.1
44517	38.2	-71.4	ALL	P	SUR	376	11	3	2.3	0.6	2.4
44549	53.0	-23.9	ALL	P	SUR	1108	2	0	1.7	-0.1	1.7
44550	52.3	-22.0	ALL	P	SUR	1117	0	0	1.5	0.1	1.5
44553	58.5	-28.4	ALL	P	SUR	1	0	0	0.0	0.1	0.1
44590	52.9	-21.5	ALL	P	SUR	1	0	0	0.0	-1.6	1.6
44601	42.4	-60.5	ALL	P	SUR	44	0	0	0.7	-0.5	0.8
44602	42.2	-56.2	ALL	P	SUR	47	0	0	0.5	-0.4	0.7
44612	26.8	-36.1	ALL	P	SUR	687	0	0	0.4	-0.5	0.7
44616	42.9	-17.3	ALL	P	SUR	673	0	0	0.6	0.0	0.6
44621	64.3	-30.4	ALL	P	SUR	1745	0	0	1.3	0.3	1.4
44623	29.6	-23.7	ALL	P	SUR	1	0	0	0.0	0.2	0.2
44624	45.2	-25.2	ALL	P	SUR	690	0	0	0.7	0.2	0.8
44625	43.3	-25.4	ALL	P	SUR	680	0	0	0.6	0.0	0.6
44627	42.5	-29.4	ALL	P	SUR	603	2	0	1.0	-0.3	1.0
44716	62.9	-29.5	ALL	P	SUR	1	0	0	0.0	0.1	0.1
44721	29.9	-30.8	ALL	P	SUR	682	0	0	0.5	-0.1	0.5
44723	47.0	-36.9	ALL	P	SUR	670	1	0	1.3	0.3	1.3
44726	62.8	-30.7	ALL	P	SUR	1615	1	0	0.9	0.0	0.9
44728	52.0	-35.8	ALL	P	SUR	1663	2	0	1.4	-0.6	1.5
44730	55.5	-26.4	ALL	P	SUR	1232	3	0	1.2	0.0	1.2
44737	41.8	-60.9	ALL	P	SUR	1	0	0	0.0	-0.1	0.1
44742	59.0	-16.9	ALL	P	SUR	1282	0	0	0.8	-0.1	0.9
44743	61.0	-24.5	ALL	P	SUR	1170	4	0	1.1	-0.3	1.2
44760	58.4	-18.9	ALL	P	SUR	13	2	15	4.9	-1.4	5.1
44763	47.9	-40.2	ALL	P	SUR	911	3	0	1.4	0.0	1.4
44764	51.8	-38.3	ALL	P	SUR	678	0	0	1.3	-0.5	1.4
44767	49.4	-46.1	ALL	P	SUR	416	0	0	1.1	-0.1	1.1
44768	47.5	-50.0	ALL	P	SUR	145	0	0	0.9	-0.3	1.0
44770	47.9	-12.1	ALL	P	SUR	1	0	0	0.0	-1.1	1.1
44775	29.4	-38.6	ALL	P	SUR	700	0	0	0.4	-0.7	0.8
44778	48.0	-10.9	ALL	P	SUR	976	0	0	0.7	-0.1	0.7
44779	53.9	-29.6	ALL	P	SUR	546	4	1	1.5	-0.6	1.6

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
44780	54.2	-38.7	ALL	P	SUR	474	0	0	0.9	-0.4	1.0
44808	40.5	-69.4	ALL	P	SUR	1	0	0	0.0	-0.3	0.3
44825	44.4	-73.2	ALL	P	SUR	1	0	0	0.0	-5.1	5.1
44868	47.5	-50.1	ALL	P	SUR	1	0	0	0.0	0.6	0.6
45552	20.6	-51.4	ALL	P	SUR	1	0	0	0.0	-0.4	0.4
45749	43.5	-82.1	ALL	P	SUR	1	0	0	0.0	0.3	0.3
45808	44.3	-82.4	ALL	P	SUR	2	0	0	0.4	-0.2	0.5
47556	62.7	-64.0	ALL	P	SUR	350	1	0	1.0	0.5	1.1
54552	63.8	-34.2	ALL	P	SUR	1	0	0	0.0	-0.9	0.9
62501	30.3	-28.6	ALL	P	SUR	671	1	0	0.7	0.3	0.8
62502	42.5	-18.2	ALL	P	SUR	1	0	0	0.0	-0.7	0.7
62503	31.1	-19.8	ALL	P	SUR	691	0	0	0.8	-0.5	0.9
62504	36.8	-18.0	ALL	P	SUR	651	0	0	0.6	0.1	0.7
62512	43.3	-17.9	ALL	P	SUR	875	0	0	1.2	-0.4	1.2
62516	49.1	-10.5	ALL	P	SUR	704	0	0	0.7	-0.5	0.9
62518	36.7	-14.9	ALL	P	SUR	915	0	0	0.8	-0.3	0.8
62520	62.0	-10.0	ALL	P	SUR	545	0	0	0.8	-0.1	0.8
62558	60.3	-12.1	ALL	P	SUR	1	0	0	0.0	-0.5	0.5
62584	36.8	-18.1	ALL	P	SUR	1	0	0	0.0	0.4	0.4
62594	55.0	-22.4	ALL	P	SUR	1	0	0	0.0	-0.5	0.5
62597	51.7	-20.2	ALL	P	SUR	1	0	0	0.0	-2.3	2.3
62598	61.5	-11.6	ALL	P	SUR	836	1	0	1.0	-0.4	1.1
62694	55.4	-23.1	ALL	P	SUR	1569	0	0	1.5	0.1	1.5
62696	53.1	-19.7	ALL	P	SUR	1112	3	0	1.4	-0.4	1.5
62697	51.8	-21.6	ALL	P	SUR	1107	3	0	1.6	-0.3	1.6
62701	50.6	-2.6	ALL	P	SUR	2	0	0	0.3	0.2	0.4
62703	49.9	-2.9	ALL	P	SUR	1	0	0	0.0	0.5	0.5
62705	55.0	-12.7	ALL	P	SUR	1	0	0	0.0	-0.9	0.9
62711	57.3	-35.3	ALL	P	SUR	460	1	0	0.8	0.2	0.8
62763	47.5	-8.5	ALL	P	SUR	1	0	0	0.0	-0.5	0.5
62881	51.0	-13.4	ALL	P	SUR	2	0	0	0.5	-0.2	0.5
63662	77.8	-9.9	ALL	P	SUR	481	5	1	1.3	0.2	1.3
63663	70.1	-25.3	ALL	P	SUR	382	6	2	1.2	0.3	1.2
64549	57.0	-22.4	ALL	P	SUR	766	8	1	1.4	-0.5	1.5
64552	63.8	-36.4	ALL	P	SUR	1235	0	0	1.0	-0.3	1.1
64553	58.1	-28.7	ALL	P	SUR	700	1	0	0.9	-0.5	1.0
64560	60.0	-29.9	ALL	P	SUR	181	0	0	1.1	0.0	1.1
WIND SPEED											
13503	23.7	-25.4	ALL	SPEED	SUR	2	0	0	0.4	10.1	10.1
41501	15.8	-55.3	ALL	SPEED	SUR	6	0	0	0.3	11.6	11.6
41523	30.4	-43.4	ALL	SPEED	SUR	368	4	1	7.2	1.9	7.4
41528	10.8	-49.8	ALL	SPEED	SUR	11	0	0	0.3	12.5	12.5
41552	20.7	-52.2	ALL	SPEED	SUR	620	3	0	1.6	-0.1	1.6
41554	22.8	-72.3	ALL	SPEED	SUR	20	0	0	0.8	-4.6	4.7
41556	16.0	-71.6	ALL	SPEED	SUR	608	0	0	2.6	2.1	3.3
41557	21.3	-70.0	ALL	SPEED	SUR	622	34	5	4.3	1.8	4.6
41559	21.3	-68.6	ALL	SPEED	SUR	622	0	0	2.0	0.3	2.0
41560	16.5	-61.3	ALL	SPEED	SUR	190	0	0	4.1	-1.3	4.3
41561	21.6	-54.9	ALL	SPEED	SUR	593	1	0	1.7	0.2	1.7
41563	19.7	-49.7	ALL	SPEED	SUR	619	0	0	1.7	-0.1	1.7
41625	21.0	-48.0	ALL	SPEED	SUR	12	0	0	1.7	11.9	12.0
41645	30.1	-78.0	ALL	SPEED	SUR	613	1	0	1.6	0.5	1.7
41647	30.5	-70.3	ALL	SPEED	SUR	603	1	0	1.8	0.4	1.8
41648	26.5	-71.9	ALL	SPEED	SUR	616	0	0	1.9	0.6	2.0
41652	29.2	-63.6	ALL	SPEED	SUR	536	44	8	5.6	4.2	7.0
42533	38.0	-67.8	ALL	SPEED	SUR	326	172	53	5.8	16.4	17.4
44601	42.4	-60.5	ALL	SPEED	SUR	42	0	0	3.8	3.9	5.4
44602	42.2	-56.2	ALL	SPEED	SUR	46	0	0	3.0	1.7	3.5

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
WIND SPEED											
44742	59.0	-16.9	ALL	SPEED	SUR	1	0	0	0.0	-0.1	0.1
44779	53.9	-29.6	ALL	SPEED	SUR	1	1	100			
44808	40.5	-69.4	ALL	SPEED	SUR	1	0	0	0.0	-1.9	1.9
44825	44.4	-73.2	ALL	SPEED	SUR	1	0	0	0.0	4.0	4.0
45552	20.6	-51.4	ALL	SPEED	SUR	1	0	0	0.0	-3.4	3.4
62520	62.0	-10.0	ALL	SPEED	SUR	540	0	0	2.9	2.0	3.5
62581	51.0	-13.3	ALL	SPEED	SUR	1	0	0	0.0	-2.2	2.2
62703	49.9	-2.9	ALL	SPEED	SUR	1	0	0	0.0	2.8	2.8
62705	55.0	-12.7	ALL	SPEED	SUR	1	0	0	0.0	-0.5	0.5
62711	57.3	-35.3	ALL	SPEED	SUR	457	0	0	2.4	0.8	2.6
62763	47.5	-8.5	ALL	SPEED	SUR	2	0	0	0.0	0.3	0.3
62881	51.0	-13.4	ALL	SPEED	SUR	2	0	0	0.6	-0.6	0.8
WIND DIRECTION											
13503	23.7	-25.4	ALL	DIRN.	SUR	2	0	0	10.2	22.0	24.2
41501	15.8	-55.3	ALL	DIRN.	SUR	6	0	0	0.7	31.0	31.0
41523	30.4	-43.4	ALL	DIRN.	SUR	149	4	3	25.3	-21.1	32.9
41528	10.8	-49.8	ALL	DIRN.	SUR	11	0	0	9.5	46.3	47.2
41552	20.7	-52.2	ALL	DIRN.	SUR	505	3	1	17.8	-2.7	18.0
41556	16.0	-71.6	ALL	DIRN.	SUR	543	0	0	17.0	2.0	17.1
41557	21.3	-70.0	ALL	DIRN.	SUR	481	34	7	15.2	-10.0	18.2
41559	21.3	-68.6	ALL	DIRN.	SUR	442	0	0	17.2	-0.8	17.2
41560	16.5	-61.3	ALL	DIRN.	SUR	109	0	0	16.8	18.0	24.6
41561	21.6	-54.9	ALL	DIRN.	SUR	515	1	0	14.7	-3.1	15.0
41563	19.7	-49.7	ALL	DIRN.	SUR	503	0	0	13.9	-5.1	14.8
41625	21.0	-48.0	ALL	DIRN.	SUR	12	0	0	17.6	15.9	23.7
41645	30.1	-78.0	ALL	DIRN.	SUR	392	1	0	25.2	0.8	25.2
41647	30.5	-70.3	ALL	DIRN.	SUR	323	1	0	13.3	-8.2	15.6
41648	26.5	-71.9	ALL	DIRN.	SUR	364	0	0	17.9	25.9	31.5
41652	29.2	-63.6	ALL	DIRN.	SUR	368	44	12	17.8	-7.3	19.2
42533	38.0	-67.8	ALL	DIRN.	SUR	301	172	57	14.7	0.3	14.7
44601	42.4	-60.5	ALL	DIRN.	SUR	31	0	0	14.4	6.9	16.0
44602	42.2	-56.2	ALL	DIRN.	SUR	38	0	0	23.9	-9.4	25.7
44742	59.0	-16.9	ALL	DIRN.	SUR	1	0	0	0.0	-8.3	8.3
44779	53.9	-29.6	ALL	DIRN.	SUR	1	1	100			
45552	20.6	-51.4	ALL	DIRN.	SUR	1	0	0	0.0	2.3	2.3
62520	62.0	-10.0	ALL	DIRN.	SUR	456	0	0	14.1	-0.8	14.1
62581	51.0	-13.3	ALL	DIRN.	SUR	1	0	0	0.0	-11.9	11.9
62705	55.0	-12.7	ALL	DIRN.	SUR	1	0	0	0.0	-18.9	18.9
62711	57.3	-35.3	ALL	DIRN.	SUR	405	0	0	30.7	25.2	39.7
62763	47.5	-8.5	ALL	DIRN.	SUR	1	0	0	0.0	-2.4	2.4
62881	51.0	-13.4	ALL	DIRN.	SUR	2	0	0	1.3	-1.9	2.3

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: April 2002

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Statistics for each airline carrier.
Area monitored		:40°N - 70°N, 60°W - 0°W.
Standard of comparison		:Background field from UKMO global model.
Observation times		:All hours combined.
Level(s) monitored		:300.0 - 150.0 hPa
Elements monitored		:TEMP in °C ; WIND in m s^{-1}
Parameters monitored	:N REP.	:Number of observations received excluding duplicates.
	:PG	:Percentage of observations with gross errors.
	:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
	:PC	:Percentage of observations with calm winds.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.
GROSS ERROR LIMITS	:10.0 °C ; 60 m s^{-1} Vector Wind	
SELECTION CRITERIA	:N REP $\geq$ 20	

NB : All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

			TEMPERATURE					WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	809	2	7	1.8	0.1	706	0	5	0	8.4	0.6
ACA	1013	1	2	1.5	-0.2	1007	0	3	0	6.7	0.7
AEA	156	1	4	1.2	0.1	53	2	4	0	5.7	0.0
AEL	345	0	11	1.6	-0.8	274	0	13	0	6.7	1.0
AEY	82	0	4	2.0	1.1	62	0	6	0	10.3	0.4
AFL	321	1	3	1.8	0.2	315	1	3	0	7.2	0.7
AFR	813	0	10	1.6	0.3	657	1	12	0	7.2	0.5
AIH	176	0	4	1.2	-0.1	151	0	5	0	5.9	0.8
AJM	221	1	3	1.4	-0.4	161	0	2	0	7.2	1.3
AMM	76	1	13	1.2	0.3	41	0	12	0	4.9	0.9
AMX	172	3	6	1.2	-0.1	126	2	8	0	9.4	0.5
AZA	304	0	6	2.0	0.4	276	0	6	0	9.3	0.3
BAF	34	3	3	1.6	-0.8	31	0	0	0	4.7	1.6
BAL	121	0	17	1.2	-0.2	98	1	22	0	9.8	-1.4
BAW	490	1	8	1.8	-0.4	472	0	7	0	6.6	0.5
BSK	26	0	19	3.2	-1.3	23	0	13	0	9.6	2.1
BWA	45	2	9	2.1	1.3	27	4	22	0	13.4	-0.5
CFG	379	0	1	1.5	-0.6	299	0	2	0	7.6	-0.4
CGL	28	0	0	1.3	0.0	30	0	0	0	6.5	0.4
CLX	223	0	1	1.5	-0.5	224	0	4	0	6.2	0.3
COA	113	1	12	1.3	-0.4	74	0	18	0	8.8	1.2
CRL	315	1	5	1.5	0.1	213	1	7	0	7.2	0.6
CUB	110	0	3	1.4	0.8	86	2	8	0	8.7	0.7
DAL	952	0	14	1.6	-0.6	873	1	16	0	7.7	0.5
DCE	73	0	11	1.1	0.2	61	0	18	0	9.7	0.6
DCS	23	0	4	1.1	-0.6	23	0	4	0	4.0	0.6
DLH	695	0	9	1.3	0.2	670	0	10	0	5.6	0.5
EDW	46	0	2	1.8	-0.2	36	0	0	0	4.8	1.1
EEZ	39	0	15	1.1	0.7	29	0	21	0	8.9	-0.6
EIA	128	1	5	1.7	0.2	125	0	100	0	17.9	3.4
ELY	78	1	1	1.6	0.4	83	0	5	0	8.1	-0.1
ETH	28	0	18	1.9	-0.3	28	0	18	0	6.4	1.5
EWW	61	0	10	2.1	-0.3	59	0	7	0	7.2	1.5
FDX	729	1	33	1.4	0.1	740	0	33	0	7.3	1.5
FIN	250	0	3	1.5	0.1	232	0	6	0	8.3	0.7
GCO	128	1	5	2.1	0.8	120	0	100	0	17.2	6.7
GRL	32	0	0	1.5	0.1	29	0	0	0	4.5	1.7
GTI	152	0	4	1.5	-0.4	153	0	5	0	7.2	0.9
IBE	892	0	9	1.4	0.3	554	1	14	0	7.1	0.5
ICE	849	0	3	1.5	-0.1	802	0	5	0	6.8	1.1
JMC	34	0	9	1.1	0.3	30	0	7	0	4.5	1.1
KLM	921	0	4	1.5	0.1	772	0	5	0	6.8	0.7
LDA	72	0	10	0.9	-0.3	60	0	13	0	8.4	0.2
LDI	315	1	62	1.6	-0.2	230	1	5	0	8.3	-0.6
LIB	272	0	10	1.4	0.6	164	1	15	0	5.8	0.3
LOT	152	1	3	1.6	-0.8	145	0	3	0	6.0	0.9
LTU	512	0	5	1.5	0.0	407	0	8	0	7.2	0.7
MON	61	2	3	1.3	-0.1	45	0	2	0	5.2	0.2
MPD	95	0	5	1.9	-0.1	44	0	9	0	11.3	0.3
MPH	333	0	4	1.6	-0.8	302	0	4	0	6.5	0.1
NCA	26	0	4	2.4	0.1	25	0	0	0	6.0	0.4
NWA	3007	0	2	1.5	0.4	3029	0	2	0	6.6	0.7
PAC	168	1	8	2.0	-0.2	170	1	9	0	8.3	1.1
RCH	201	3	100	1.7	0.3	180	1	100	0	15.8	2.0
RJA	20	0	0	1.2	-0.1	26	0	4	0	11.4	-1.8
RRR	44	7	18	1.6	0.0	41	0	12	0	7.6	1.7
RZO	63	0	54	2.4	0.3	38	0	3	0	8.3	1.4
SHE	22	0	5	2.5	0.8	23	0	9	0	9.7	1.1
SLR	132	1	14	1.2	0.1	117	1	15	0	5.9	-0.1

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
SVA	51	0	10	2.2	0.8	53	0	9	0	8.0	-0.1
TAP	202	2	6	1.5	-0.3	95	0	7	0	8.6	0.1
TSC	50	0	4	1.2	0.0	41	0	7	0	9.2	-2.6
UAL	284	0	70	1.9	-1.0	283	0	71	0	7.5	0.5
UPS	942	1	47	1.9	0.3	924	0	46	0	7.7	0.8
USA	157	1	5	1.5	-0.1	116	0	6	0	7.5	1.0
VIR	329	1	4	1.5	0.1	340	0	5	0	7.7	1.3
WOA	36	0	0	1.4	0.0	33	0	18	0	9.5	2.5
EU	21560	0	30	1.2	0.1	21560	0	29	0	4.5	0.6
KL	959	0	11	1.3	0.6	960	0	11	0	5.0	1.2
N	190	4	8	2.3	0.3	195	0	5	0	7.2	1.0
US ACARS	42808	6	52	1.2	0.1	42808	0	47	0	5.0	0.7

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: April 2002

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DBBH	00	Z	100	3	0	10.7	58.3	57.3
DBBH	12	Z	100	10	1	11.1	40.4	38.9
ELML7	00	Z	100	13	1	9.3	25.7	23.9
ELML7	12	Z	100	11	0	44.9	63.3	44.6
FNOR	00	Z	100	4	0	24.5	31.0	19.0
FNOR	12	Z	100	2	0	24.0	26.0	10.0
FNOU	00	Z	100	6	0	13.7	15.7	-7.7
FNOU	12	Z	100	4	0	25.1	29.4	15.3
FNPH	00	Z	100	9	0	10.5	28.7	26.8
FNPH	12	Z	100	8	0	19.2	33.3	27.3
FNRS	00	Z	100	7	0	26.2	27.4	-8.3
FNRS	12	Z	100	9	0	25.3	25.3	0.3
LDWR	00	Z	100	29	0	10.9	11.6	3.8
LDWR	12	Z	100	27	0	9.3	9.3	-0.8
OVYA2	00	Z	100	4	1	25.2	26.3	7.5
OVYA2	12	Z	100	5	0	33.3	37.3	-16.8
OXTS2	00	Z	100	7	0	11.1	11.1	1.0
OXTS2	12	Z	100	7	0	8.1	8.2	1.6
SWJS	00	Z	100	6	0	10.7	35.2	33.5
SWJS	12	Z	100	4	0	7.2	22.0	20.8
V2XO	00	Z	100	6	0	6.3	29.7	29.0
V2XO	12	Z	100	4	0	20.0	25.0	15.0
WPKD	00	Z	100	4	2	13.7	21.5	16.5
WPKD	12	Z	100	7	0	14.7	17.5	9.4
ZCBP6	00	Z	100	5	0	13.9	20.3	14.8
ZCBP6	12	Z	100	8	0	31.9	48.2	36.1
03953	00	Z	100	28	0	12.0	28.4	25.8
03953	12	Z	100	27	0	10.6	33.7	32.0
04018	00	Z	100	27	0	12.1	21.1	17.3
04018	12	Z	100	27	0	11.2	16.0	11.4
04220	00	Z	100	28	0	7.5	8.0	2.8
04220	12	Z	100	27	0	7.0	7.4	2.6
04270	00	Z	100	28	0	10.4	10.8	-2.8
04270	12	Z	100	27	0	16.9	17.0	-2.1
04339	00	Z	100	26	0	7.6	12.1	9.4
04339	12	Z	100	26	0	10.1	14.3	10.0
04360	00	Z	100	28	0	8.9	11.0	6.5
04360	12	Z	100	27	0	9.8	12.6	8.0
08001	00	Z	100	28	0	26.1	26.1	-0.4
08001	12	Z	100	24	0	22.2	23.1	-6.3
08508	12	Z	100	26	0	13.7	25.1	21.1
08522	00	Z	100	25	0	9.0	29.3	27.8
08522	12	Z	100	28	0	7.7	19.3	17.7
08594	12	Z	100	19	0	20.3	48.8	44.4
60020	00	Z	100	29	0	12.6	39.8	37.8
60020	12	Z	100	25	0	13.4	35.2	32.6
71600	00	Z	100	29	0	16.4	16.8	3.8
71600	12	Z	100	28	0	23.5	32.8	22.8
72201	00	Z	100	28	0	14.2	51.5	49.5
72201	12	Z	100	28	0	27.2	52.4	44.8
72402	00	Z	100	29	0	13.0	40.7	38.6
72402	12	Z	100	27	0	18.9	58.0	54.8
74494	00	Z	100	28	0	12.8	19.3	14.5
74494	12	Z	100	27	0	14.6	19.4	12.9
78016	00	Z	100	28	0	12.2	30.8	28.3
78016	12	Z	100	23	0	20.7	45.0	39.9

TABLE 11

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: April 2002

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DASAPX	12	Z	500	2	0	72.0	105.4	-77.0
DBBH	00	Z	500	5	0	6.5	11.9	10.0
DBBH	12	Z	500	14	0	6.9	11.3	8.9
ELML7	00	Z	500	15	0	6.7	7.0	2.0
ELML7	12	Z	500	11	0	22.1	25.2	12.0
FNOR	00	Z	500	7	0	10.3	17.2	13.7
FNOR	12	Z	500	4	0	13.6	21.8	17.0
FNOU	00	Z	500	8	0	7.6	8.5	-3.8
FNOU	12	Z	500	7	0	54.8	57.1	-16.0
FNPH	00	Z	500	12	0	6.1	6.4	1.9
FNPH	12	Z	500	9	0	5.9	8.0	5.3
FNRS	00	Z	500	12	0	8.4	14.3	-11.6
FNRS	12	Z	500	10	0	8.3	10.2	-5.9
LDWR	00	Z	500	29	0	7.9	10.2	6.4
LDWR	12	Z	500	27	0	12.1	12.4	3.1
OVYA2	00	Z	500	4	1	13.2	13.8	4.0
OVYA2	12	Z	500	5	0	19.2	21.0	-8.6
OXTS2	00	Z	500	7	0	6.2	6.3	0.9
OXTS2	12	Z	500	7	0	8.3	8.4	1.3
SWJS	00	Z	500	6	0	7.3	15.7	13.8
SWJS	12	Z	500	4	0	7.8	15.4	13.3
V2XO	00	Z	500	7	0	9.6	19.2	16.6
V2XO	12	Z	500	6	0	17.8	20.9	11.0
WPKD	00	Z	500	4	2	5.5	6.2	3.0
WPKD	12	Z	500	7	0	8.6	9.3	3.6
ZCBP6	00	Z	500	5	0	7.3	16.2	14.4
ZCBP6	12	Z	500	9	0	16.4	27.4	21.9
03953	00	Z	500	29	0	8.9	15.7	13.0
03953	12	Z	500	28	0	7.5	15.4	13.4
04018	00	Z	500	29	0	7.3	15.1	13.3
04018	12	Z	500	28	0	8.9	13.7	10.4
04220	00	Z	500	28	0	7.5	8.9	4.8
04220	12	Z	500	27	0	8.6	10.5	5.9
04270	00	Z	500	28	0	7.6	8.9	4.8
04270	12	Z	500	27	0	10.0	10.8	4.1
04339	00	Z	500	27	0	10.5	17.1	13.6
04339	12	Z	500	26	0	9.4	16.1	13.1
04360	00	Z	500	28	0	10.2	10.5	2.5
04360	12	Z	500	27	0	9.5	11.0	5.5
08001	00	Z	500	29	0	14.4	14.4	-0.3
08001	12	Z	500	24	0	10.5	10.5	-0.3
08508	12	Z	500	26	0	8.7	10.1	5.1
08522	00	Z	500	25	0	6.9	8.8	5.4
08522	12	Z	500	28	0	5.8	9.0	6.8
08594	12	Z	500	23	0	9.9	9.9	0.7
60020	00	Z	500	29	0	7.8	9.9	6.2
60020	12	Z	500	27	0	9.7	14.0	10.1
71600	00	Z	500	29	0	10.3	10.8	-3.3
71600	12	Z	500	28	0	15.9	18.5	9.5
72201	00	Z	500	29	0	4.9	11.7	10.6
72201	12	Z	500	28	0	6.8	8.6	5.3
72402	00	Z	500	29	0	5.2	12.5	11.4
72402	12	Z	500	28	0	7.2	10.7	7.9
74494	00	Z	500	28	0	6.9	7.2	2.0
74494	12	Z	500	28	0	8.2	8.5	2.1
78016	00	Z	500	28	0	7.8	13.9	11.5
78016	12	Z	500	25	0	9.4	16.1	13.1

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: April 2002

Monitoring procedures		
Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBBH	00	V	100	3	0	0	6.4	3.6	4.0
DBBH	12	V	100	8	0	0	5.9	3.3	2.4
ELML7	00	V	100	11	0	0	5.3	-0.8	2.3
ELML7	12	V	100	10	0	0	4.5	0.5	-0.8
FNOR	00	V	100	5	0	0	4.5	-0.4	2.4
FNOR	12	V	100	3	0	0	2.3	-0.3	-1.3
FNOU	00	V	100	8	0	0	3.6	-0.6	-0.2
FNOU	12	V	100	4	0	0	4.2	0.8	-1.8
FNPH	00	V	100	5	0	0	3.8	-0.2	0.9
FNPH	12	V	100	7	0	0	3.5	0.0	2.1
FNRS	00	V	100	6	0	0	5.4	2.1	2.3
FNRS	12	V	100	9	0	0	3.4	2.1	0.1
LDWR	00	V	100	29	0	0	2.5	-0.2	0.3
LDWR	12	V	100	27	0	0	2.5	-0.4	0.2
OVYA2	00	V	100	3	0	0	3.4	1.7	-0.8
OVYA2	12	V	100	4	0	0	3.6	-1.5	1.1
OXTS2	00	V	100	6	0	0	6.2	0.1	1.5
OXTS2	12	V	100	6	0	0	2.2	1.0	1.6
SWJS	00	V	100	6	0	0	4.6	1.1	-0.1
SWJS	12	V	100	4	0	0	2.2	-0.2	1.6
V2XO	00	V	100	6	0	0	2.5	-1.0	1.2
V2XO	12	V	100	4	0	0	1.7	0.4	-0.1
WPKD	00	V	100	6	0	0	3.7	1.4	-0.2
WPKD	12	V	100	6	0	0	5.6	1.6	-0.1
ZCBP6	00	V	100	3	0	0	4.2	2.7	1.0
ZCBP6	12	V	100	7	0	0	4.4	1.2	-0.8
03953	00	V	100	26	0	0	2.7	0.6	-0.1
03953	12	V	100	26	0	0	2.8	-0.3	-0.1
04018	00	V	100	25	0	0	3.3	0.8	0.4
04018	12	V	100	27	0	0	3.0	0.8	0.0
04220	00	V	100	28	0	0	2.7	0.7	0.9
04220	12	V	100	26	0	0	2.7	0.6	0.7
04270	00	V	100	27	0	0	3.9	0.8	1.0
04270	12	V	100	26	0	0	4.0	0.5	1.6
04339	00	V	100	25	0	4	5.1	-0.4	0.3
04339	12	V	100	26	0	0	4.2	0.6	0.2
04360	00	V	100	28	0	0	2.7	-0.3	0.2
04360	12	V	100	27	0	0	2.9	0.4	1.1
08001	00	V	100	26	0	0	3.7	0.6	0.6
08001	12	V	100	24	0	0	5.3	-1.4	-1.7
08508	12	V	100	10	0	0	4.6	0.6	-2.3
08522	00	V	100	23	0	0	4.0	0.7	0.7
08522	12	V	100	28	0	0	4.3	0.6	0.5
08594	12	V	100	19	0	100	7.3	-1.3	2.5
60020	00	V	100	27	0	0	5.2	1.2	1.8
60020	12	V	100	24	0	0	5.0	0.5	1.9
71600	00	V	100	29	0	0	4.3	1.2	0.4
71600	12	V	100	28	0	0	5.0	-0.3	0.5
72201	00	V	100	27	0	0	3.5	-0.5	0.3
72201	12	V	100	28	0	0	3.9	0.7	0.8
72402	00	V	100	28	0	0	4.3	0.9	-0.6
72402	12	V	100	27	0	0	4.4	-0.4	0.8
74494	00	V	100	27	0	100	3.6	0.0	0.8
74494	12	V	100	27	0	100	3.8	0.8	0.1
78016	00	V	100	28	0	0	4.6	1.7	0.5
78016	12	V	100	22	0	0	5.7	-0.3	0.7

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: April 2002

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS:	Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DASAPX	12	V	500	1	0	0	1.0	-0.1	-1.0
DBBH	00	V	500	4	0	0	5.2	-1.8	-1.1
DBBH	12	V	500	14	0	0	4.0	0.2	0.6
ELML7	00	V	500	12	0	0	3.1	0.1	0.8
ELML7	12	V	500	10	0	0	3.3	-0.2	-0.6
FNOR	00	V	500	9	0	0	2.8	1.1	-0.4
FNOR	12	V	500	5	0	20	9.8	3.4	3.4
FNOU	00	V	500	7	0	0	3.8	0.0	-0.3
FNOU	12	V	500	7	0	0	4.3	-2.4	1.4
FNPH	00	V	500	5	0	0	3.4	0.0	1.9
FNPH	12	V	500	6	0	0	3.5	-1.4	1.5
FNRS	00	V	500	11	1	0	5.3	-0.3	-0.5
FNRS	12	V	500	11	0	0	3.0	0.3	1.2
LDWR	00	V	500	29	0	0	3.5	-0.4	0.1
LDWR	12	V	500	27	0	0	4.2	0.4	-0.7
OVYA2	00	V	500	4	0	25	16.3	-3.4	-4.9
OVYA2	12	V	500	4	0	0	3.0	0.5	0.1
OXTS2	00	V	500	7	0	14	7.6	-0.8	-2.1
OXTS2	12	V	500	7	0	0	6.7	-3.1	1.6
SWJS	00	V	500	6	0	0	4.6	-0.4	-0.2
SWJS	12	V	500	4	0	0	2.0	-0.2	0.2
V2XO	00	V	500	7	0	0	3.6	1.6	-0.1
V2XO	12	V	500	6	0	0	3.9	-0.9	-0.4
WPKD	00	V	500	6	0	0	3.3	1.0	0.9
WPKD	12	V	500	6	0	0	5.2	0.3	0.6
ZCBP6	00	V	500	2	0	0	1.2	-0.2	-0.2
ZCBP6	12	V	500	7	0	0	4.3	-0.2	-0.2
03953	00	V	500	27	0	0	3.6	-1.3	0.2
03953	12	V	500	27	0	0	4.3	1.3	-0.1
04018	00	V	500	29	0	3	5.4	-0.9	-1.5
04018	12	V	500	27	0	0	4.0	0.9	-0.3
04220	00	V	500	28	0	0	4.4	-0.4	-0.6
04220	12	V	500	26	0	0	3.8	-0.8	-1.3
04270	00	V	500	28	0	0	4.0	-0.2	-0.2
04270	12	V	500	27	0	0	4.6	-0.6	-0.1
04339	00	V	500	27	0	3	5.6	-0.4	-0.1
04339	12	V	500	26	0	0	5.4	0.0	-0.5
04360	00	V	500	28	0	0	3.8	-1.0	0.2
04360	12	V	500	27	0	0	4.4	0.2	0.8
08001	00	V	500	29	0	0	3.9	-0.2	-1.3
08001	12	V	500	24	0	4	6.4	-1.0	-0.8
08508	12	V	500	13	0	0	4.1	-1.6	-0.9
08522	00	V	500	25	0	0	3.7	-0.2	-0.3
08522	12	V	500	28	0	0	4.0	0.2	0.3
08594	12	V	500	23	1	100	4.2	0.2	1.3
60020	00	V	500	28	0	0	4.2	0.3	0.1
60020	12	V	500	26	0	0	3.9	0.3	-0.5
71600	00	V	500	29	0	0	4.2	-0.3	1.1
71600	12	V	500	28	0	0	4.2	0.6	1.4
72201	00	V	500	29	0	0	2.7	0.9	-0.4
72201	12	V	500	28	0	0	2.8	0.3	-0.3
72402	00	V	500	27	0	0	3.0	0.7	0.9
72402	12	V	500	28	0	0	3.3	0.5	0.3
74494	00	V	500	28	0	100	3.6	-1.1	0.4
74494	12	V	500	27	0	100	3.6	-0.9	0.9
78016	00	V	500	28	0	0	3.6	-0.2	0.2
78016	12	V	500	25	0	0	3.4	0.8	0.7

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed m s^{-1}
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45